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**St. Louis Park/Edina Groundwater  
Volatile Organic Compounds  
Contamination Study - Phase IV (2008)**

**Task 1001 - Monitoring and  
Testing Three OPCJ Wells**

STS Project 200703587

June 30, 2008

**Prepared by:**

Peter A. Rzepecki, PhD PHg PG  
Senior Project Hydrogeologist  
STS  
763-315-6345

STS  
10900 73 Ave. North, Suite 150, Maple Grove, MN 55369  
T 763.315.6300 F 763.315.1836

June 30, 2008

Mr. Nile Fellows  
Minnesota Pollution Control Agency  
520 Lafayette Road  
St. Paul, MN 55155

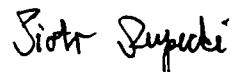
Re: St. Louis Park / Edina Groundwater VOC Contamination Study – Phase IV (2008), Task 1001 –  
Monitoring and Testing the Three OPCJ Wells; STS Project 200703587

Dear Mr. Fellows:

We are pleased to present this report "St. Louis Park / Edina Groundwater Volatile Organic Compound Contamination Study – Phase IV (2007), Task 1001: Monitoring and Testing the Three OPCJ Wells: Edina Well No. 7, Edina OPCJ Test Well and Meadowbrook Golf Course Well". The work was conducted following the scope of work outlined in STS Proposal 200701405, Task 1001 (June 29, 2007). The proposal was approved as stated in the Contract Work Order SFST0802 issued by MPCA on July 9, 2007. This work order is a continuation of the City of Edina Well No. 7 Study – Phase I, Phase II and Phase III and St. Louis Park / Edina / Hopkins Groundwater VOC Study conducted since July 2004.

This report presents the results of monitoring and testing of the three wells conducted since July 2007. If you have any questions, please contact Peter Rzepecki at 763-315-6345 or Robert DeGroot at 763-315-6317.

Sincerely,

  
Peter Rzepecki, PhD, PHg, PG  
Senior Hydrogeologist

  
Robert DeGroot, PE, PG  
Principal Engineer

PR/dn  
Encs.

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## 1.0 Introduction

Vinyl chloride (VC) contamination detected in the City of Edina Municipal Well Number 7 (ED-7) triggered a multi-phase investigation conducted since 2004. That investigation documented the presence of a large volatile organic compound (VOC) plume in the Prairie du Chien – Jordan Aquifer (OPCJ) and in the shallower aquifers, centered on an area within the boundaries of the City of St. Louis Park. Since the City of Edina produces the OPCJ groundwater for municipal water supply system, there is a concern that more of the St. Louis Park VOC plume may be drawn into the Edina area and its municipal wells. Remedial actions depend on good quality monitoring data and assessment of groundwater dynamics, flow directions and contaminant concentration trends.

One of the most important monitoring activities conducted during the last year phase of the investigation was collection of water level data from the three wells:

- Edina Well No. 7 (ED-7)
- Edina OPCJ Test Well (Edina Test Well 1)
- Meadowbrook Golf Course Well (also known as W-119, further designated as Meadowbrook Well)

The collected data revealed trends and dynamics of the groundwater system that are of particular importance to this investigation (see Section 2 of this Letter Report).

In November 2007, Edina Municipal Well No. 15 was pumped for 12 hours and the collected data allowed estimation of the OPCJ aquifer transmissivity (see Section 3 of this Letter Report).

Also, Edina Test Well 1 was subject to tests that are described in Section 4 of this report.

## 2.0 Water Level Monitoring in Three OPCJ Wells

On March 23, 2007, Minnesota Department of Health (MDH) installed a transducer and data logger in ED-7 and started monitoring water level in that well once every 30 minutes. MDH maintained the transducer and data logger during a period of time from March 8, 2005 through June 7, 2005. Monitoring water levels at that well was terminated when, on June 7, 2005, the water level in the well dropped below the transducer.

On June 6, 2007, STS staff installed a transducer and data logger in the Test Well 1 and initiated measurements of water levels in that well once every 30 minutes.

STS has been operating transducer and data logger in the Meadowbrook Well since May 19, 2005.

The water level data collected (beginning from 2005) are presented on Figure 1. That figure demonstrates the presence of a highly dynamic groundwater system with the distinct seasonal cycles of water levels. Water levels during summertime drop about 40 feet below water levels during wintertime when the water demand is the lowest.

The Test Well became the third OPCJ well in the area in which continuous water level monitoring is taking place – the other two are ED-7 and Meadowbrook Well. Monitoring water levels at these three wells allowed calculation of a horizontal hydraulic gradient magnitude (ft/ft) and direction of groundwater flow in the important area of the boundary between the Cities of St. Louis Park and Edina. STS developed a proprietary Excel spreadsheet program to automate these gradient calculations and the results are summarized on a sequence of figures numbered 2 through 10.

### Hydraulic Gradient during the Summer of 2007

Figure 2 demonstrates that during Summer of 2007, groundwater was flowing from the direction of St. Louis Park toward Edina (flow angle range from 225° to 360°; explanation: groundwater flow direction 0° or 360 ° equals flow toward East, flow direction 180° equals flow toward West, etc.) 27.06% of the time (1.75% + 7.48% + 17.83%).

Figure 3 demonstrates that groundwater flow during Summer of 2007 was frequently shifting from one direction to another.

Figure 4 demonstrates that most of the time groundwater gradient during Summer of 2007 was in a range of 0.0001 ft/ft to 0.0005 ft/ft (explanation: water level along the direction of groundwater flow was dropping from 1 foot to 5 feet per 10,000 feet of horizontal distance along the direction of groundwater flow).

### Hydraulic Gradient during the Fall of 2007

Figure 5 demonstrates that during Fall of 2007, groundwater was flowing from the direction of St. Louis Park toward Edina (flow angle range from 225° to 360°) 48.41% of the time (1.87% + 8.20% + 38.34%). That 48.41% does not

include a two week period of time when the data is missing. Based on inspection of Figure 6, it is assumed that during that time of missing data, groundwater was flowing toward the NE part of Edina, in the direction bracketed by 315° to 360°.

Figure 6 demonstrates that groundwater flow during Fall of 2007 was flowing most of the time in the direction ranging from 315° to 360° (toward NE part of Edina). In the late part of Fall 2007, groundwater was flowing in the direction ranging from 45° to 90° (toward NNE and away from Edina).

Figure 7 demonstrates that in the early part of Fall 2007, groundwater gradient was in a range of 0.0002 ft/ft to 0.0004 ft/ft. During mid and late part of Fall 2007 groundwater gradient was higher - in a range of 0.0005 ft/ft to 0.0008 ft/ft.

#### Hydraulic Gradient during the Winter of 2008

Figure 8 demonstrates that during Winter of 2008, groundwater was flowing from the direction of St. Louis Park toward Edina (flow angle range from 225° to 360°) only 0.98% of the time (0.00% + 0.00% + 0.98%).

Figure 9 demonstrates that groundwater flow during Winter of 2008 most of the time was not changing direction, which was predominantly E – ENE (the direction ranging from 0° to 45°), away from Edina.

Figure 10 demonstrates that most of the time groundwater gradient during Winter of 2008 was higher than during Summer and Fall 2007 - in a range of 0.0004 ft/ft to 0.0012 ft/ft.

### 3.0 Edina Municipal Well No. 15 Aquifer Test

The City of Edina pumped the Edina Municipal Well No. 15 (ED-15) on June 21, 2007 at the rate of 950 gpm for a period of 12 hours, at the request of STS. However, the resting period (period during which no pumping was conducted from any neighboring high capacity municipal wells before pumping test) began only 7 hours prior to pumping from ED-15. This 7-hour resting period proved way too short for the sub-regional cone of depression to recover. Consequently, the water level data collected from the Edina Test Well and the Meadowbrook Well during the test were of questionable quality for conducting aquifer test analysis as two opposing trends were affecting drawdown data – recovering sub-regional cone of depression and developing ED-15 cone of depression (for more details of this test see the “Construction and Testing of the Edina OPCJ Test Well. STS Project No. 200605032, June 29, 2007” – project conducted by STS on behalf of Minnesota Pollution Control Agency).

The pumping test on ED-15 was repeated in November 2007. At the request of STS (acting on behalf of the MPCA), the City of Edina pumped ED-15 on Friday, November 16, 2007 at the rate of 950 gpm for a period of 12 hours. This pumping test was preceded by a 24-hour resting period during which none of the OPCJ Edina municipal wells were pumped. Also, during that resting period, the City of St. Louis Park shut-down the St. Louis Park Municipal Well No. 4 for 24 hours prior to the ED-15 pumping test and kept it shut during the entire pumping test and the following recovery test.

The aquifer test data and analysis are presented in Appendix A, in Tables 1-A through 9-A and on Figure 1-A.

Figure 1-A (included in Appendix A) shows water level data collected from the three monitoring wells: ED-7, ED Test Well and Meadowbrook Well, during the 24-hour resting period prior to the test, during the 12-hour pumping test and during the 6-hour recovery period (6 hours after termination of pumping from ED-15, other municipal wells started pumping, thus breaking the recovery test). Tables 1-A, 2-A and 3-A present the collected water level data. As Figure 1-A demonstrates, the resting (non-pumping) period triggered a massive recovery of water level in the City of Edina area. The 24-hour period of non-pumping again proved not long enough to bring about recovery of the sub-regional cone of depression caused by pumping municipal wells in Edina and St. Louis Park. This sub-regional water level recovery certainly continued well into a period of pumping from ED-15.

It is likely that the water level data collected during the pumping test are affected by a continued recovery of the sub-regional cone of depression. This influence likely also affected water level data collected during the recovery period (after pumping from ED-15 ceased), although to a much smaller extent (later phases of recovery of the sub-regional cone of depression). The expected net effect is an overestimation of the value of transmissivity calculated using pump test period data and underestimation of the value of transmissivity calculated using recovery period (post-pumping period) data.

The collected pumping period data were subject to Theis Method analysis (see Tables 4-A, 5-A and 6-A). The collected recovery period data were subject to Theis' Recovery Method analysis (see Tables 7-A, 8-A and 9-A). The calculated transmissivity values are tabulated below.

Pump Test Data – Theis Method:

ED-7 Well draw-down data	$T = 76,322 \text{ gpd/ft}$	(see Table 4-A)
ED Test Well draw-down data	$T = 73,004 \text{ gpd/ft}$	(see Table 5-A)
Meadowbrook Well draw-down data	$T = 66,367 \text{ gpd/ft}$	(see Table 6-A)

Recovery Test Data – Theis' Recovery Method:

ED-7 Well draw-down data	$T = 76,318 \text{ gpd/ft}$	(see Table 7-A)
ED Test Well draw-down data	$T = 43,610 \text{ gpd/ft}$	(see Table 8-A)
Meadowbrook Well draw-down data	$T = 44,893 \text{ gpd/ft}$	(see Table 9-A)

These transmissivity estimates were compared to the results of the sixteen OPCJ aquifer tests performed in the southeast portion of Hennepin County (Table 3-5 for summary of this data – this table was included in Appendix A and was taken from another STS Project No. 99330-XD). The November 2007 ED-15 aquifer test derived transmissivity values are within the range of the values calculated from other aquifer tests in the area.

## 4.0 HydroLab Test - Profiling of the Edina OPCJ Test Well

Steve Robertson and others of the Minnesota Department of Health (MDH) conducted a HydroLab profiling using the HydroLab Minisonde 3A, on January 2 and November 15, 2007. This profiling involved continuous measurements of conductivity, pH, dissolved oxygen and temperature. The results are presented on Figures 1 and 2 titled "Water Quality Indicator Parameters", provided in Appendix B – Downhole Geophysical Logging Results – Hydrolab Profiling.

Below are the draft notes provided by Steve Robertson regarding the HydroLab profiling results:

- 1) The conductivity profiles (for both testing events) are qualitatively similar. Each shows a bulge near the bottom of the casing and an anomaly at around 300 ft.... the spike at 300 ft relates directly to a zone of water inflow (flow-meter logging – see the next section). While the conductivity profile measured in January shows more pronounced changes over the interval between 300 and about 335 ft, it is discernible in the November data, too.
- 2) pH profiles for both testing events are quantitatively different but the anomalies observed on each compare well with the conductivity results collected on the same date. The spike observed in both the pH and D.O. data from January is spurious and was due to equipment problems.
- 3) The D.O. profile from January reflects the profile one would have expected in a deep aquifer (concentrations near 0). In contrast, the November data, while low, don't quite drop to zero, but for all practical purposes is not present. It is curious that the D.O. profiles measured above the bottom of the casing each show more noise than is observed in the open hole.
- 4) The temperature data for both testing events are quantitatively different (though not by much down in the open hole), but qualitatively similar. However, one is not certain if the November data picked up the blip observed in January at about 300 ft that seems to correspond to the conductivity fluctuation.

## 5.0 Edina OPCJ Test Well Flowmeter Logging

Robert Tipping of the Minnesota Geological Survey (MGS) on January 8, 2007 conducted flow logging of the Edina OPCJ Test Well (Edina Test Well) with the use of an electromagnetic flow meter (E-M Flowmeter from Century Geophysical Corp., Tulsa, OK). The aim of logging was to detect and measure vertical groundwater flow within the Test Well's open hole section. Caliper logging was conducted with the use of a 3-arm caliper probe (2PCA-1000). The flow log and caliper log of the well are presented in Appendix C – Downhole Geophysical Logging Results – Flow Logging.

The flowmeter logging revealed a strong downward flow of groundwater from below the casing that exceeded the capacity of the flowmeter tool. According to a preliminary interpretation by Robert Tipping and Tony Runkel, MGS, groundwater enters the well's borehole through bedding plane fractures at about 274 feet below ground surface at sandstone/carbonate contact within the Shakopee formation (not the St. Peter – Prairie du Chien contact that was found at 267 feet) and travels down the hole at the rate exceeding 15 gpm. Some water might also be entering through vugs just below the casing at 272.4 feet. Additional water is entering the borehole at a vuggy interval between 297 feet and 301.5 feet and also at 310.5 feet. Some of the water is possibly leaving the borehole through vuggy interval at 325 feet to 329 feet. However, much of the water continues traveling down the hole till it reaches another vuggy interval from 370 feet to 387 feet, with significant amounts of water exiting the borehole through bedding plane fractures at 369 and 377 feet. A much smoother borehole from 340 feet to 370 feet indicates the presence of Oneota dolomite.

Jordan sandstone is encountered at 393 feet. Groundwater flowing downward within the borehole gradually enters the Jordan formation through inter-granular spaces, except for abrupt loss through a bedding plane fracture at 431.7 feet, and possibly through bedding plane fractures near the bottom of the well.

The strong down-hole flow in the Test Well may be due to pumping from a nearby well. After the January 2007 test was completed and the results of the test analyzed, it was concluded that the flowmeter logging should be repeated at the time when pumping from the nearby Edina Municipal Well No. 15 (ED-15) was monitored while logging the Edina Test Well.

The flow logging of the Edina Test Well was repeated by Robert Tipping on Friday, November 16, 2007. The logging was conducted twice – first logging before pumping from ED-15 started and the second logging after pumping from ED-15 began. The results confirmed the presence of a strong downward groundwater movement within the open section of the well, with a pattern of entrances and exits to the borehole similar to the January 8, 2007 data. In addition, the measured down-flow was slightly stronger during the ED-15 pumping compared to the flow measured before pumping from ED-15 started during the November 16th test. The document provided in Appendix C shows results from the January 8, 2007 and November 16, 2007 logging. A different flow meter was

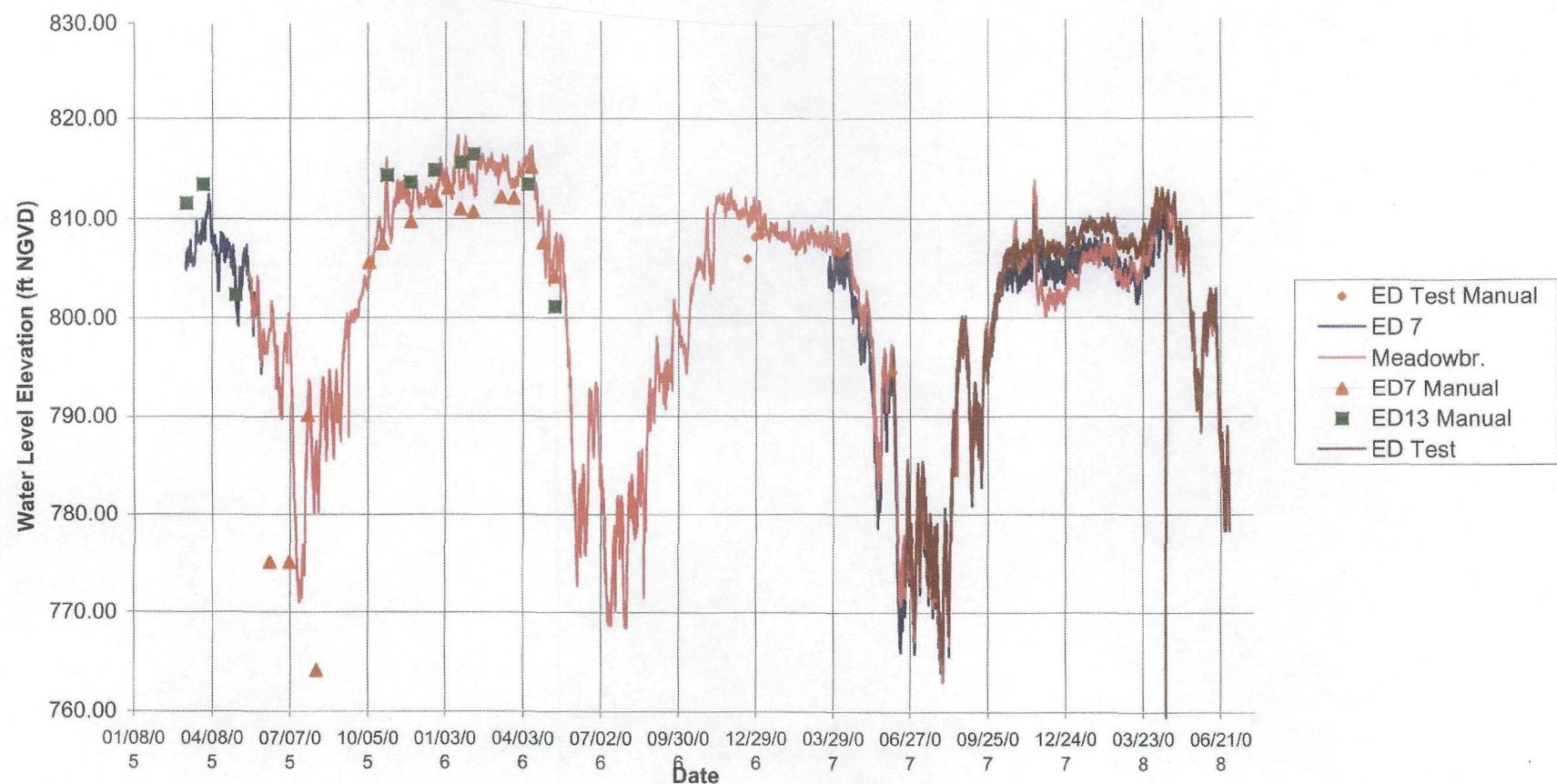
used on November 16th than was used on January 8th. Because the two tools are not identically calibrated, the results show relative changes with depth rather than absolute magnitude differences.

## **6.0 General Qualifications**

STS professional services have been performed, data collected, analyzed and findings obtained in accordance with generally accepted engineering and hydrogeologic principles and standard practices. No other warranty, either expressed or implied, is made. STS assumes no responsibility for data or interpretations made by others. STS accepts no responsibility for application or interpretation of the results by anyone other than the client.

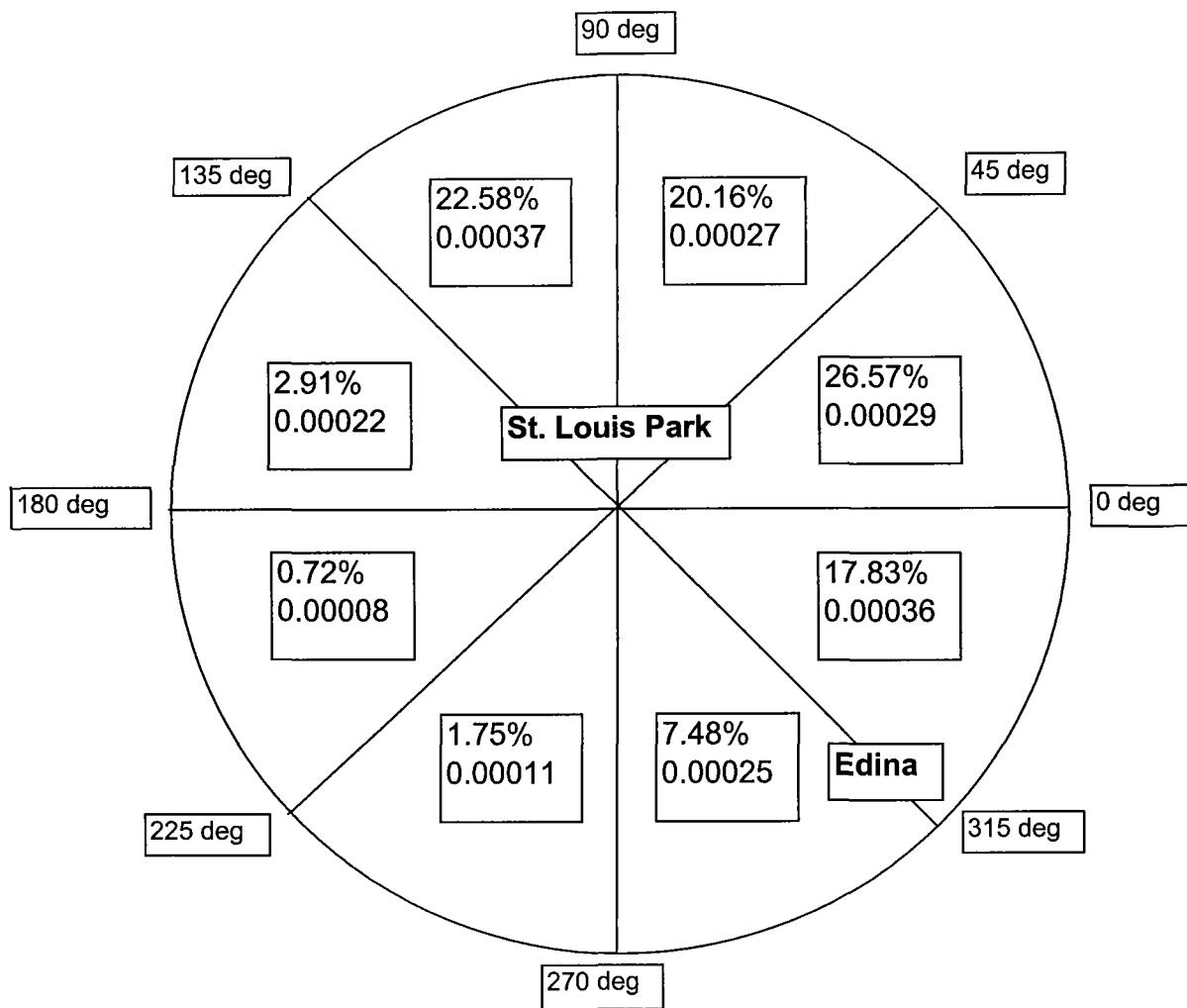
Figure 1. Edina Well No. 7, Edina Well No. 13, Meadowbrook Golf Course Well (W119) and  
Edina OPCJ Test Well Hydrographs

STS Project No. 200703587



**Figure 2. OPCJ Gradient Direction (0 - 360 deg) and Magnitude (ft/ft)**  
**Summer 2007 (6/21/07 - 9/21/07)**

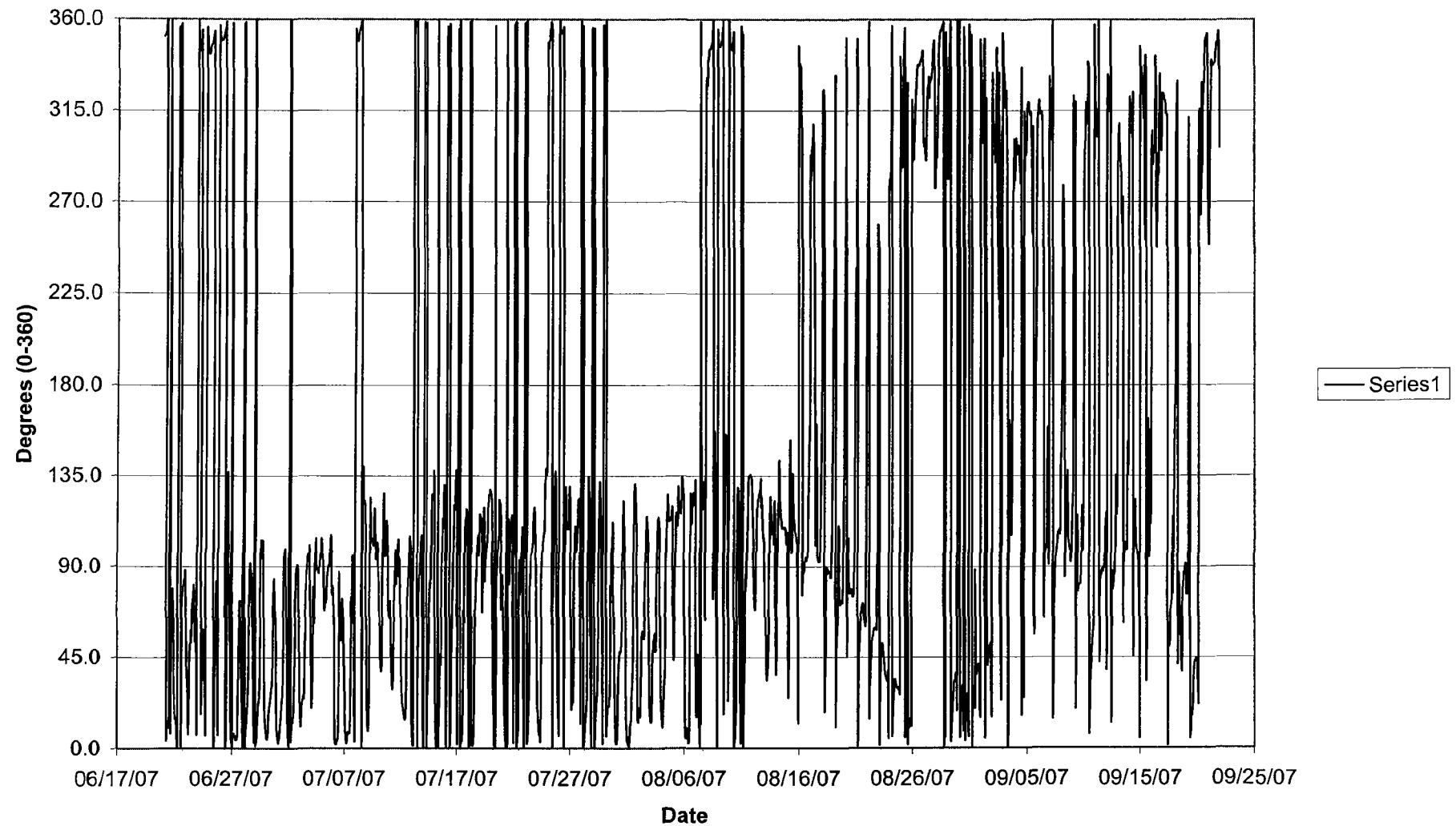
STS Project 200703587



Note: The figure shows:

17.83% - percentage of the time during Summer 2007 groundwater flowed in a particular 45 deg direction range  
0.00036 - average gradient when groundwater flowed in that particular 45 deg direction range

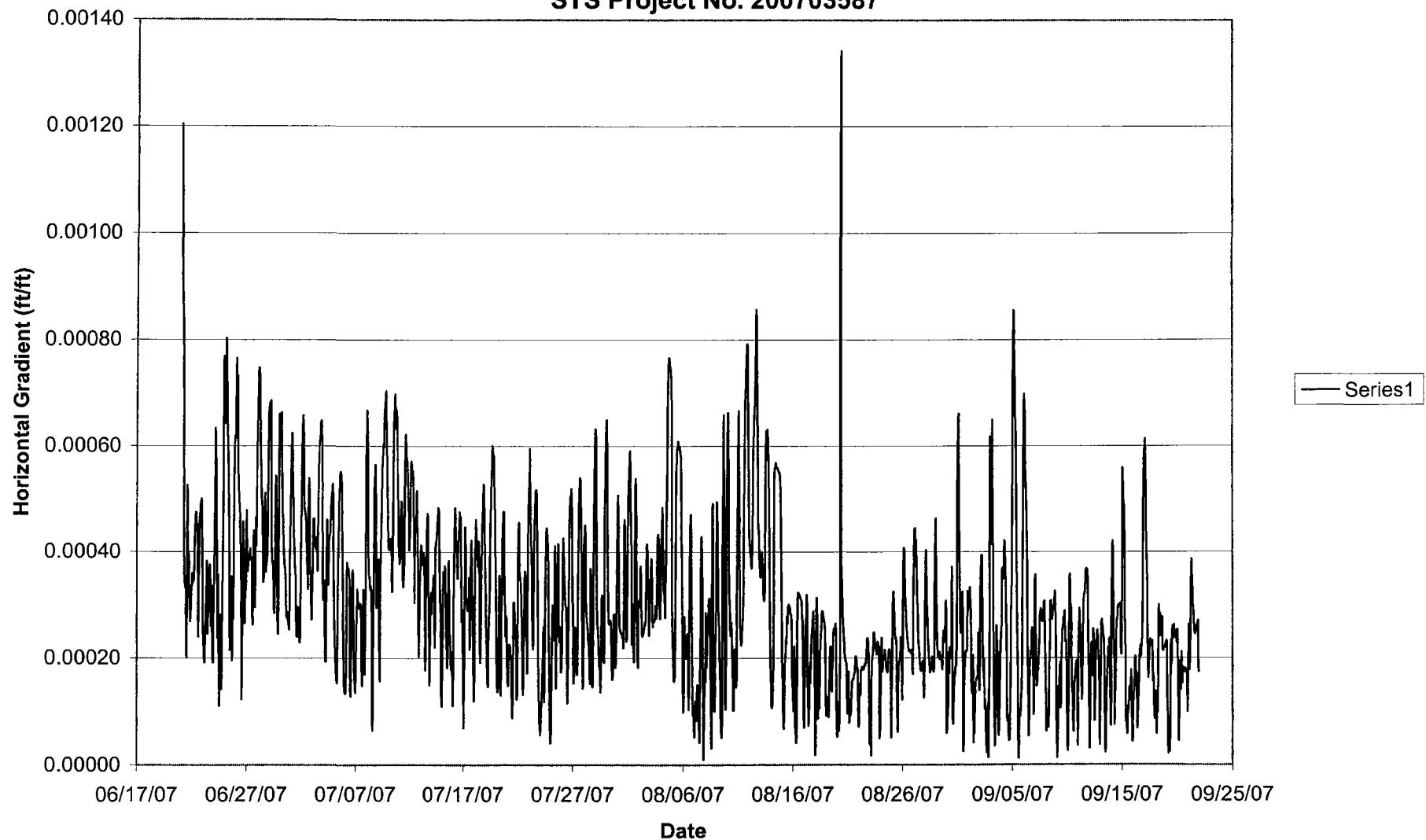
**Figure 3. Changing OPCJ Gradient Direction - St. Louis Park / Edina - Summer 2007**  
**STS Project No. 200703587**



**Figure 4. Change in OPCJ Gradient Magnitude with Time - St. Louis Park / Edina - Summer**

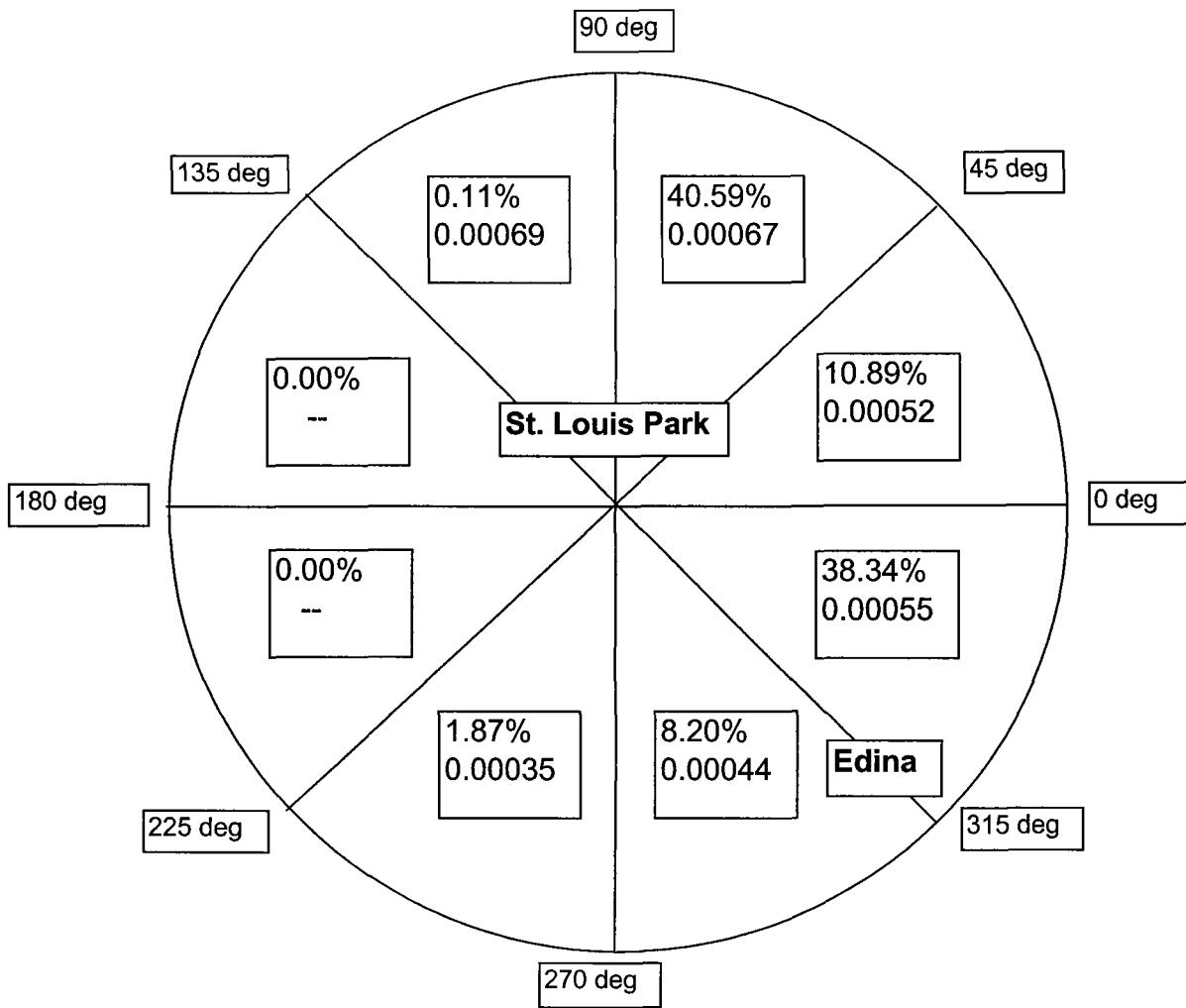
**2007**

**STS Project No. 200703587**



**Figure 5. OPCJ Gradient Direction (0 - 360 deg) and Magnitude (ft/ft)**  
**Fall 2007 (9/22/07 - 12/21/07)**

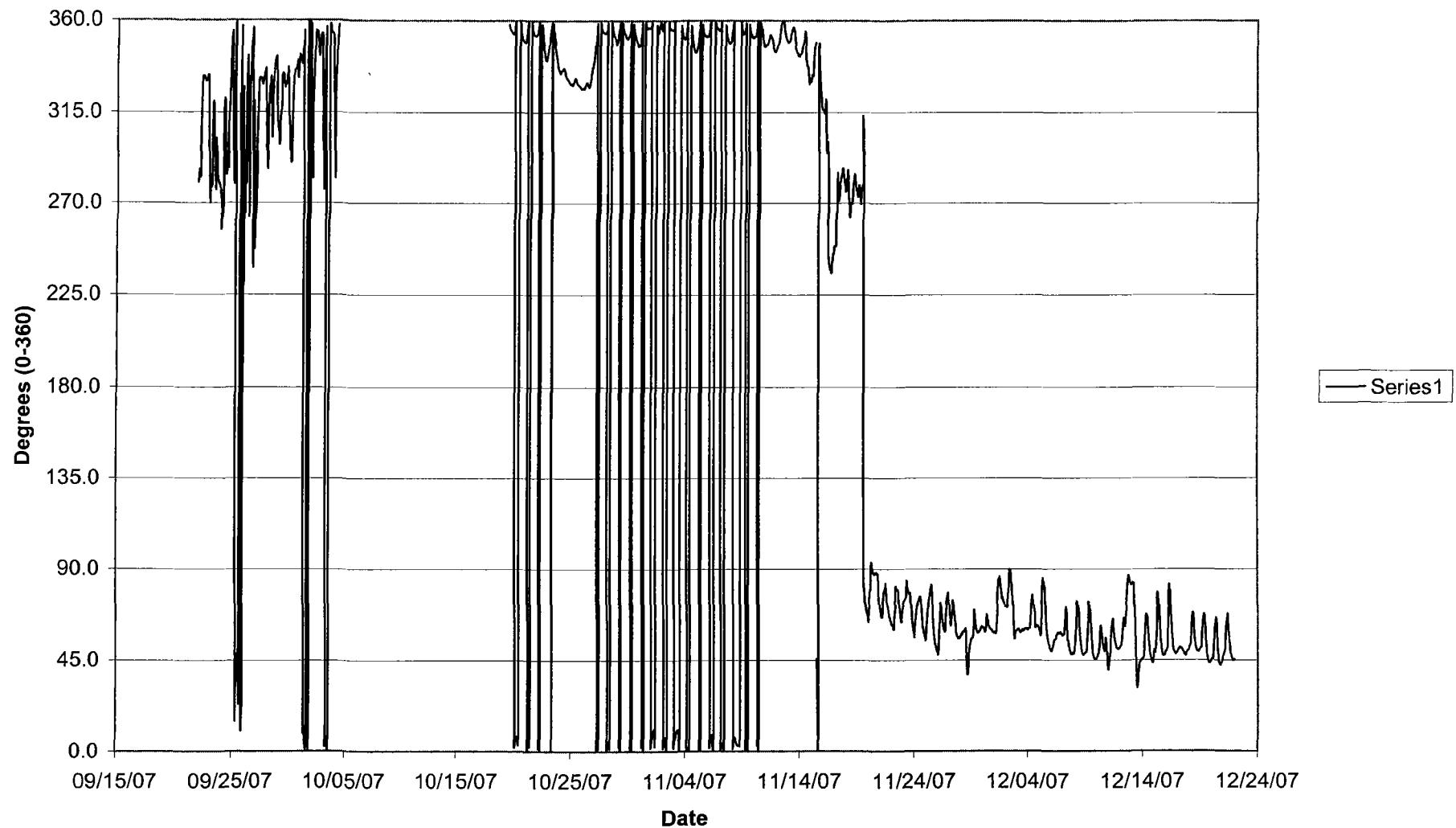
STS Project 200703587



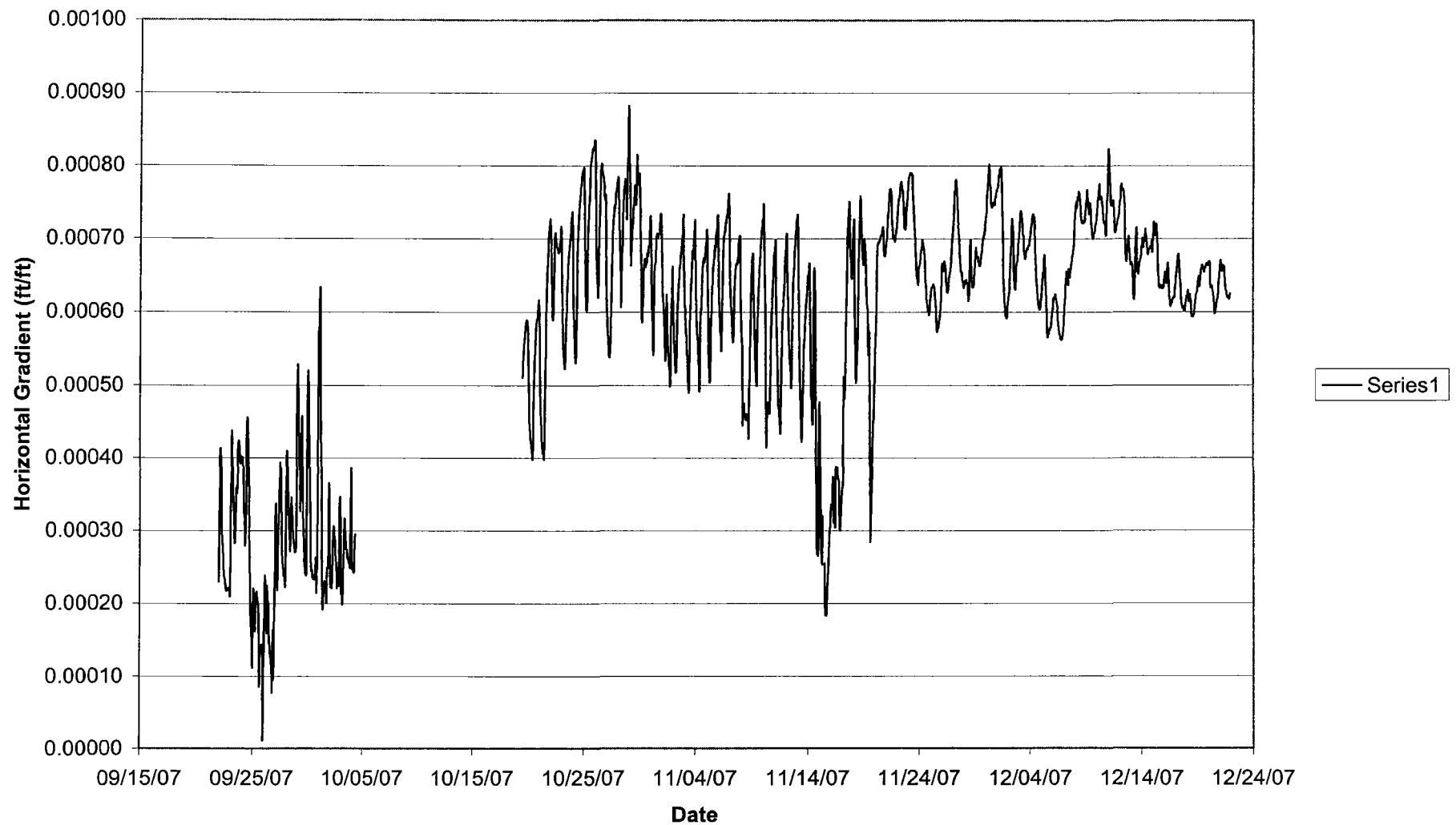
Note: The figure shows:

38.34% - percentage of the time during Fall 2007 groundwater flowed in a particular 45 deg direction range  
0.00055 - average gradient when groundwater flowed in that particular 45 deg direction range

**Figure 6. Changing OPCJ Gradient Direction - St. Louis Park / Edina - Fall 2007**  
**STS Project No. 200703587**

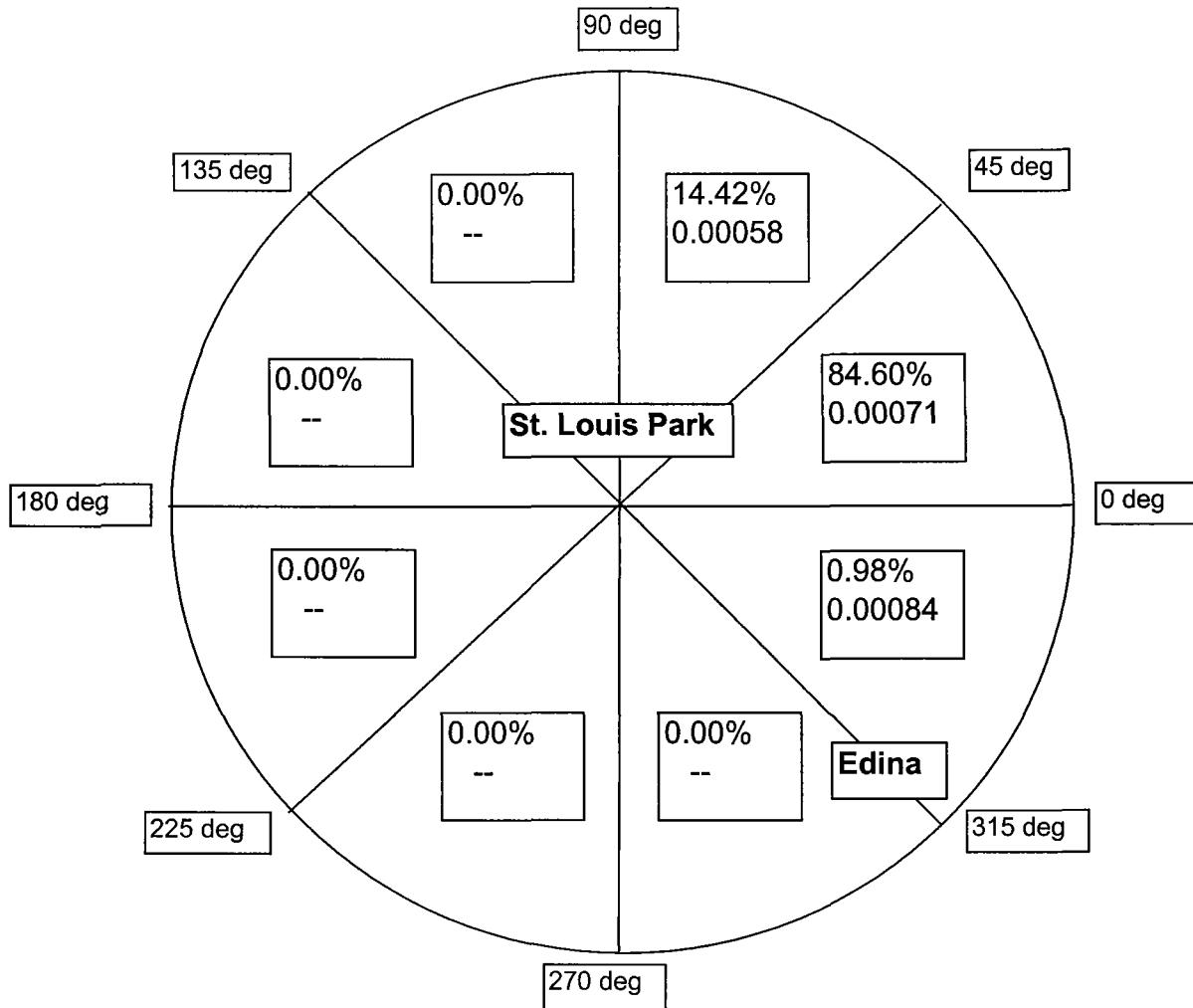


**Figure 7. Change in OPCJ Gradient Magnitude with Time - St. Louis Park / Edina - Fall 2007**  
**STS Project No. 200703587**



**Figure 8. OPCJ Gradient Direction (0 - 360 deg) and Magnitude (ft/ft)**  
**Winter 2008 (12/22/07 - 3/19/08)**

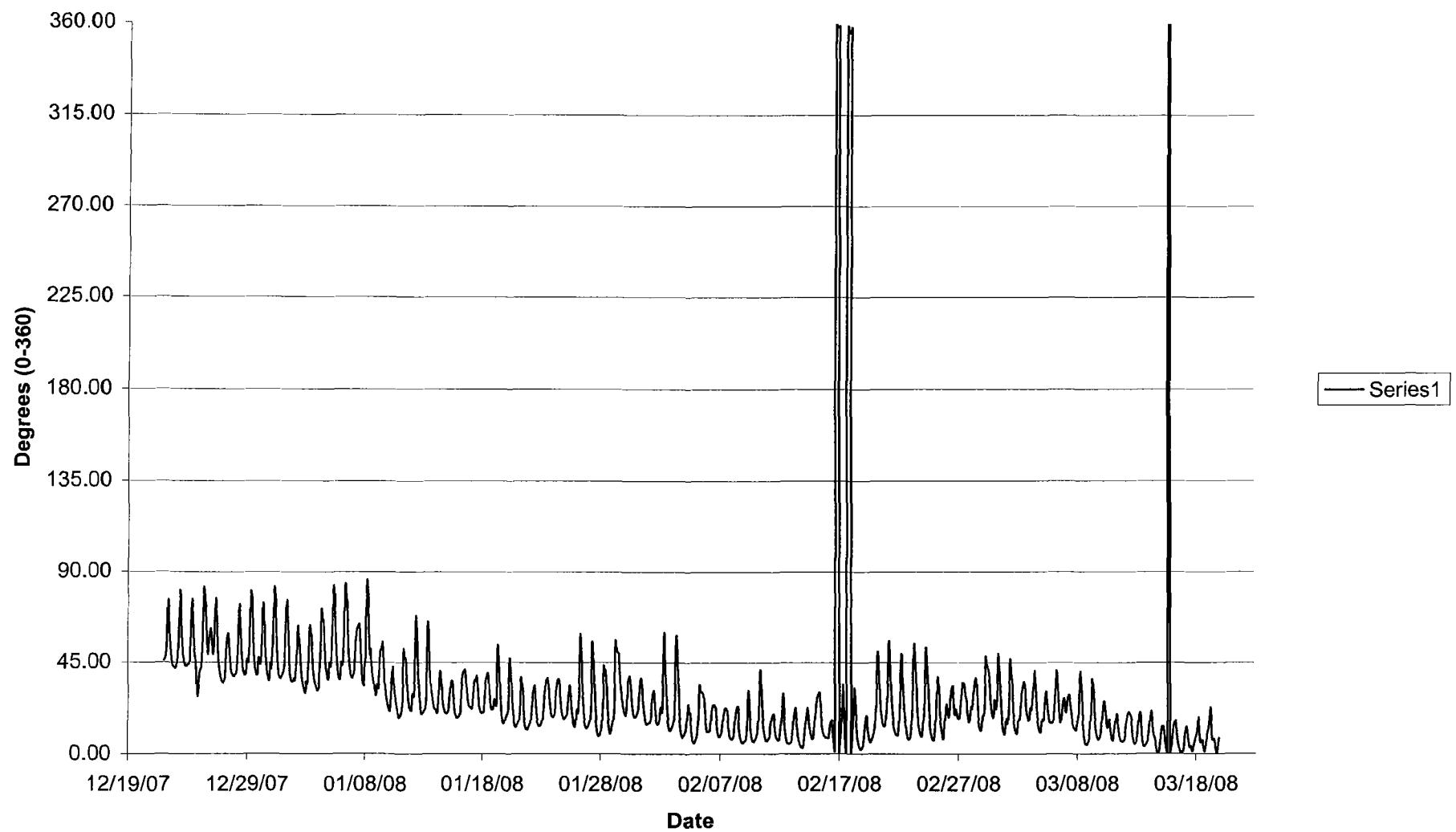
STS Project 200703587



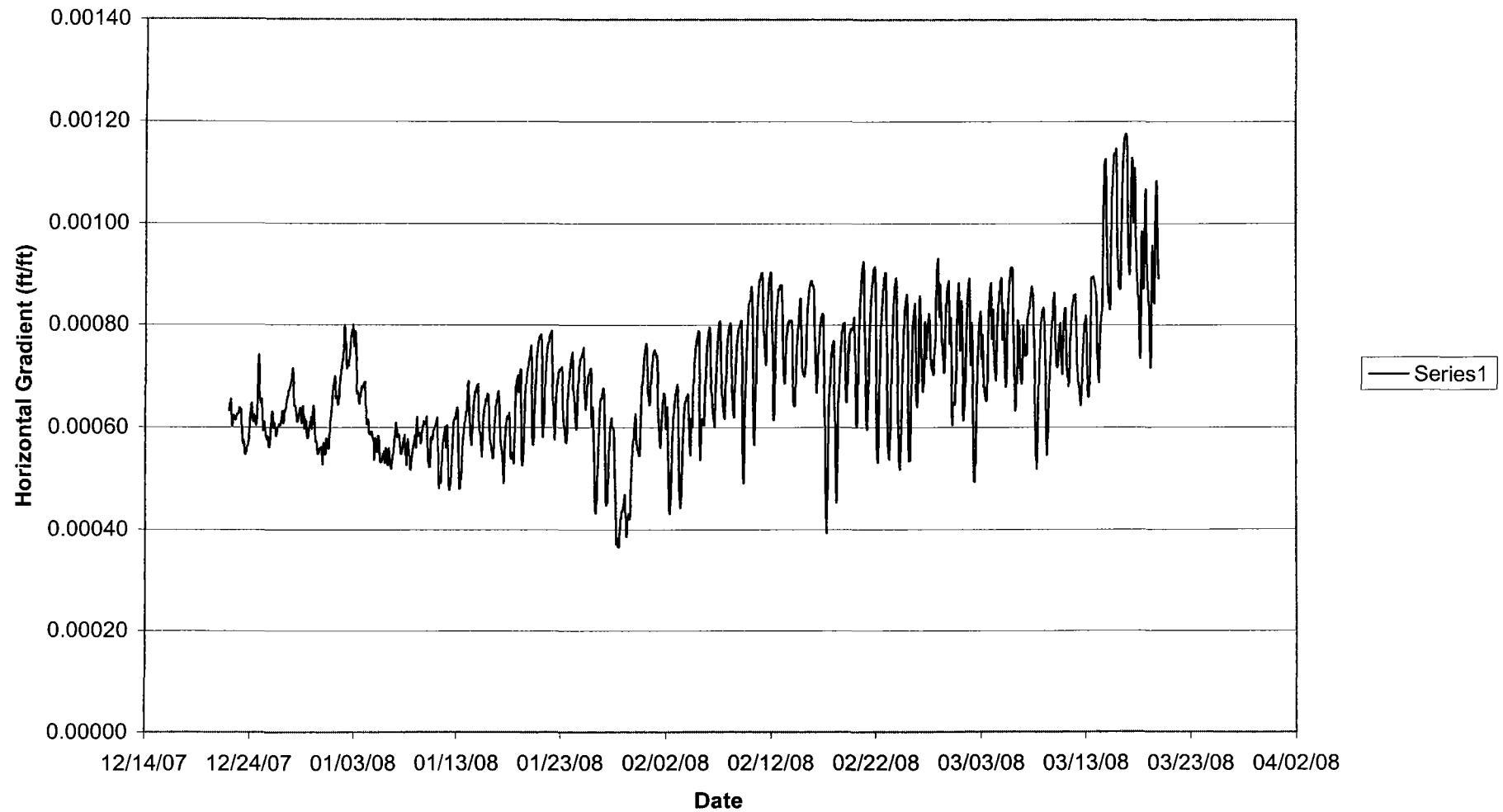
Note: The figure shows:

0.98%	- percentage of the time during Winter 2007 groundwater flowed in a particular 45 deg direction
0.00084	- average gradient when groundwater flowed in that particular 45 deg direction range

**Figure 9. Changing OPCJ Gradient Direction - St. Louis Park / Edina - Winter 2008**  
**STS Project No. 200703587**



**Figure 10. Change in OPCJ Gradient Magnitude with Time - St. Louis Park / Edina - Winter 2008**  
**STS Project No. 200703587**



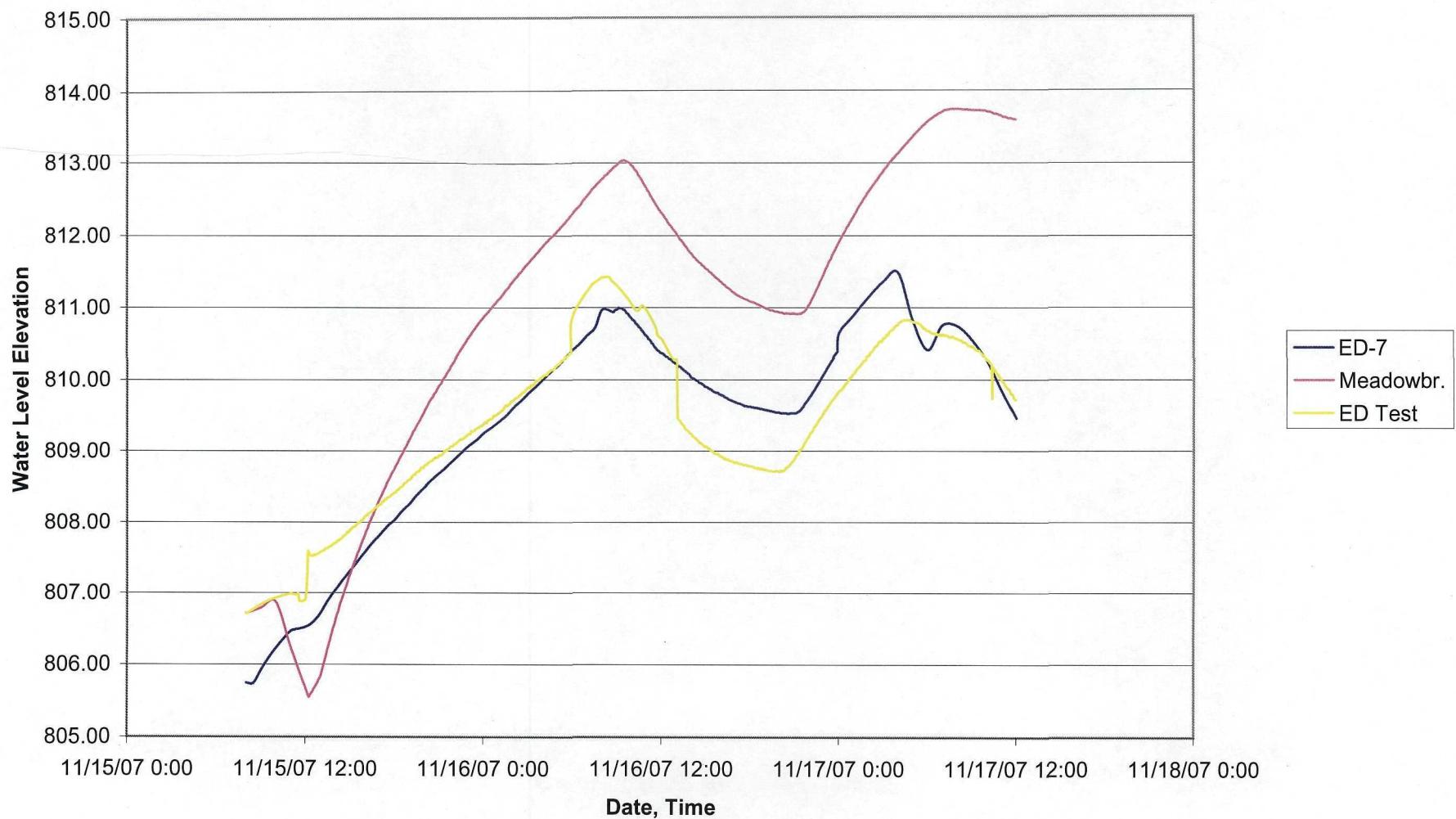
## Appendix

- Appendix A      Edina Municipal Well No. 15 Aquifer Test
- Appendix B      Downhole Geophysical Logging Results - Hydrolab Profiling
- Appendix C      Downhole Geophysical Logging Results - Flow Logging

## **Appendix A**

### **Edina Municipal Well No. 15 Aquifer Test**

**Figure 1A. ED-7, Meadowbrook and ED OPCJ Test Well Hydrographs**  
**Aquifer Test - ED-15 Pumped at a rate of 950 gpm, Nov. 16, 2007**  
**STS Project No. 200703587**



**Table 1-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina Municipal Well No. 7 Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 8:00 AM	0		810.97	0.00	0.00
11/16/07 8:45 AM	45		810.93	0.04	0.01
11/16/07 8:50 AM	50		810.96	0.01	0.00
11/16/07 8:55 AM	55		810.97	0.00	0.00
11/16/07 9:00 AM	60		810.97	0.00	0.00
11/16/07 9:05 AM	65		810.99	-0.02	-0.01
11/16/07 9:10 AM	70		810.99	-0.02	-0.01
11/16/07 9:15 AM	75		810.98	-0.01	0.00
11/16/07 9:20 AM	80		810.98	-0.01	0.00
11/16/07 9:25 AM	85		810.97	0.00	0.00
11/16/07 9:30 AM	90		810.96	0.01	0.00
11/16/07 9:35 AM	95		810.93	0.04	0.01
11/16/07 9:40 AM	100		810.92	0.05	0.02
11/16/07 9:45 AM	105		810.90	0.07	0.02
11/16/07 9:50 AM	110		810.88	0.10	0.03
11/16/07 9:55 AM	115		810.86	0.11	0.03
11/16/07 10:00 AM	120		810.84	0.13	0.04
11/16/07 10:05 AM	125		810.82	0.15	0.04
11/16/07 10:10 AM	130		810.81	0.16	0.05
11/16/07 10:15 AM	135		810.78	0.19	0.06
11/16/07 10:20 AM	140		810.77	0.21	0.06
11/16/07 10:25 AM	145		810.74	0.23	0.07
11/16/07 10:30 AM	150		810.72	0.25	0.08
11/16/07 10:35 AM	155		810.71	0.26	0.08
11/16/07 10:40 AM	160		810.68	0.29	0.09
11/16/07 10:45 AM	165		810.66	0.31	0.10
11/16/07 10:50 AM	170		810.63	0.34	0.10
11/16/07 10:55 AM	175		810.61	0.36	0.11
11/16/07 11:00 AM	180		810.60	0.37	0.11
11/16/07 11:05 AM	185		810.58	0.39	0.12
11/16/07 11:10 AM	190		810.55	0.42	0.13
11/16/07 11:15 AM	195		810.54	0.43	0.13
11/16/07 11:20 AM	200		810.51	0.46	0.14
11/16/07 11:25 AM	205		810.50	0.48	0.14

**Table 1-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina Municipal Well No. 7 Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 11:30 AM	210		810.46	0.51	0.16
11/16/07 11:35 AM	215		810.44	0.53	0.16
11/16/07 11:40 AM	220		810.42	0.55	0.17
11/16/07 11:45 AM	225		810.41	0.56	0.17
11/16/07 11:50 AM	230		810.39	0.58	0.18
11/16/07 11:55 AM	235		810.38	0.59	0.18
11/16/07 12:00 PM	240		810.37	0.60	0.18
11/16/07 12:05 PM	245		810.36	0.61	0.18
11/16/07 12:10 PM	250		810.35	0.62	0.19
11/16/07 12:15 PM	255		810.33	0.64	0.20
11/16/07 12:20 PM	260		810.32	0.65	0.20
11/16/07 12:25 PM	265		810.31	0.66	0.20
11/16/07 12:30 PM	270		810.28	0.69	0.21
11/16/07 12:35 PM	275		810.28	0.69	0.21
11/16/07 12:40 PM	280		810.26	0.71	0.22
11/16/07 12:45 PM	285		810.25	0.72	0.22
11/16/07 12:50 PM	290		810.23	0.74	0.22
11/16/07 12:55 PM	295		810.23	0.75	0.23
11/16/07 1:00 PM	300		810.21	0.76	0.23
11/16/07 1:05 PM	305		810.20	0.77	0.24
11/16/07 1:10 PM	310		810.18	0.79	0.24
11/16/07 1:15 PM	315		810.17	0.80	0.24
11/16/07 1:20 PM	320		810.16	0.81	0.25
11/16/07 1:25 PM	325		810.15	0.83	0.25
11/16/07 1:30 PM	330		810.12	0.85	0.26
11/16/07 1:35 PM	335		810.12	0.85	0.26
11/16/07 1:40 PM	340		810.10	0.87	0.26
11/16/07 1:45 PM	345		810.09	0.88	0.27
11/16/07 1:50 PM	350		810.07	0.90	0.27
11/16/07 1:55 PM	355		810.05	0.92	0.28
11/16/07 2:00 PM	360		810.03	0.94	0.29
11/16/07 2:05 PM	365		810.02	0.95	0.29
11/16/07 2:10 PM	370		810.01	0.96	0.29
11/16/07 2:15 PM	375		810.00	0.97	0.30

**Table 1-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina Municipal Well No. 7 Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 2:20 PM	380		809.99	0.98	0.30
11/16/07 2:25 PM	385		809.98	0.99	0.30
11/16/07 2:30 PM	390		809.96	1.01	0.31
11/16/07 2:35 PM	395		809.96	1.01	0.31
11/16/07 2:40 PM	400		809.95	1.02	0.31
11/16/07 2:45 PM	405		809.93	1.04	0.32
11/16/07 2:50 PM	410		809.92	1.05	0.32
11/16/07 2:55 PM	415		809.90	1.07	0.32
11/16/07 3:00 PM	420		809.90	1.07	0.33
11/16/07 3:05 PM	425		809.89	1.08	0.33
11/16/07 3:10 PM	430		809.88	1.10	0.33
11/16/07 3:15 PM	435		809.87	1.10	0.34
11/16/07 3:20 PM	440		809.86	1.11	0.34
11/16/07 3:25 PM	445		809.85	1.12	0.34
11/16/07 3:30 PM	450		809.83	1.14	0.35
11/16/07 3:35 PM	455		809.82	1.15	0.35
11/16/07 3:40 PM	460		809.82	1.15	0.35
11/16/07 3:45 PM	465		809.82	1.15	0.35
11/16/07 3:50 PM	470		809.80	1.17	0.36
11/16/07 3:55 PM	475		809.80	1.18	0.36
11/16/07 4:00 PM	480		809.79	1.18	0.36
11/16/07 4:05 PM	485		809.78	1.19	0.36
11/16/07 4:10 PM	490		809.77	1.20	0.36
11/16/07 4:15 PM	495		809.76	1.21	0.37
11/16/07 4:20 PM	500		809.75	1.22	0.37
11/16/07 4:25 PM	505		809.74	1.23	0.37
11/16/07 4:30 PM	510		809.73	1.24	0.38
11/16/07 4:35 PM	515		809.72	1.25	0.38
11/16/07 4:40 PM	520		809.71	1.26	0.38
11/16/07 4:45 PM	525		809.71	1.26	0.38
11/16/07 4:50 PM	530		809.70	1.27	0.39
11/16/07 4:55 PM	535		809.69	1.28	0.39
11/16/07 5:00 PM	540		809.68	1.29	0.39
11/16/07 5:05 PM	545		809.68	1.29	0.39

**Table 1-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina Municipal Well No. 7 Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 5:10 PM	550		809.67	1.30	0.40
11/16/07 5:15 PM	555		809.67	1.30	0.40
11/16/07 5:20 PM	560		809.66	1.31	0.40
11/16/07 5:25 PM	565		809.66	1.31	0.40
11/16/07 5:30 PM	570		809.65	1.32	0.40
11/16/07 5:35 PM	575		809.63	1.34	0.41
11/16/07 5:40 PM	580		809.63	1.34	0.41
11/16/07 5:45 PM	585		809.63	1.34	0.41
11/16/07 5:50 PM	590		809.63	1.34	0.41
11/16/07 5:55 PM	595		809.63	1.34	0.41
11/16/07 6:00 PM	600		809.63	1.34	0.41
11/16/07 6:05 PM	605		809.62	1.35	0.41
11/16/07 6:10 PM	610		809.62	1.35	0.41
11/16/07 6:15 PM	615		809.61	1.36	0.41
11/16/07 6:20 PM	620		809.61	1.36	0.41
11/16/07 6:25 PM	625		809.61	1.36	0.41
11/16/07 6:30 PM	630		809.60	1.37	0.42
11/16/07 6:35 PM	635		809.60	1.37	0.42
11/16/07 6:40 PM	640		809.60	1.37	0.42
11/16/07 6:45 PM	645		809.60	1.37	0.42
11/16/07 6:50 PM	650		809.59	1.38	0.42
11/16/07 6:55 PM	655		809.59	1.38	0.42
11/16/07 7:00 PM	660		809.58	1.39	0.42
11/16/07 7:05 PM	665		809.58	1.39	0.42
11/16/07 7:10 PM	670		809.58	1.39	0.42
11/16/07 7:15 PM	675		809.58	1.39	0.42
11/16/07 7:20 PM	680		809.57	1.40	0.43
11/16/07 7:25 PM	685		809.57	1.40	0.43
11/16/07 7:30 PM	690		809.56	1.41	0.43
11/16/07 7:35 PM	695		809.56	1.41	0.43
11/16/07 7:40 PM	700		809.55	1.42	0.43
11/16/07 7:45 PM	705		809.55	1.42	0.43
11/16/07 7:50 PM	710		809.55	1.42	0.43
11/16/07 7:55 PM	715		809.55	1.42	0.43

**Table 1-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina Municipal Well No. 7 Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test)	Cumulative Time (recovery test)	Edina OPCJ Test Well		
	[min]	[min]	Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 8:00 PM	720	0	809.54	1.43	0.44
11/16/07 8:05 PM	725	5	809.54	1.43	0.44
11/16/07 8:10 PM	730	10	809.54	1.43	0.44
11/16/07 8:15 PM	735	15	809.54	1.43	0.44
11/16/07 8:20 PM	740	20	809.54	1.43	0.44
11/16/07 8:25 PM	745	25	809.54	1.43	0.44
11/16/07 8:30 PM	750	30	809.53	1.44	0.44
11/16/07 8:35 PM	755	35	809.53	1.44	0.44
11/16/07 8:40 PM	760	40	809.54	1.43	0.44
11/16/07 8:45 PM	765	45	809.54	1.43	0.44
11/16/07 8:50 PM	770	50	809.54	1.43	0.44
11/16/07 8:55 PM	775	55	809.54	1.43	0.44
11/16/07 9:00 PM	780	60	809.54	1.43	0.44
11/16/07 9:05 PM	785	65	809.54	1.43	0.44
11/16/07 9:10 PM	790	70	809.55	1.42	0.43
11/16/07 9:15 PM	795	75	809.56	1.41	0.43
11/16/07 9:20 PM	800	80	809.58	1.39	0.42
11/16/07 9:25 PM	805	85	809.59	1.38	0.42
11/16/07 9:30 PM	810	90	809.61	1.36	0.41
11/16/07 9:35 PM	815	95	809.63	1.34	0.41
11/16/07 9:40 PM	820	100	809.66	1.31	0.40
11/16/07 9:45 PM	825	105	809.68	1.29	0.39
11/16/07 9:50 PM	830	110	809.71	1.26	0.38
11/16/07 9:55 PM	835	115	809.74	1.23	0.38
11/16/07 10:00 PM	840	120	809.76	1.21	0.37
11/16/07 10:05 PM	845	125	809.78	1.19	0.36
11/16/07 10:10 PM	850	130	809.81	1.16	0.35
11/16/07 10:15 PM	855	135	809.83	1.14	0.35
11/16/07 10:20 PM	860	140	809.85	1.12	0.34
11/16/07 10:25 PM	865	145	809.89	1.08	0.33
11/16/07 10:30 PM	870	150	809.92	1.05	0.32
11/16/07 10:35 PM	875	155	809.95	1.02	0.31
11/16/07 10:40 PM	880	160	809.98	0.99	0.30
11/16/07 10:45 PM	885	165	810.01	0.96	0.29

**Table 1-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina Municipal Well No. 7 Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Edina OPCJ Test Well				
	Cumulative Time (pump test)	Cumulative Time (recovery test)	Water Elevation	Drawdown	Drawdown
	[min]	[min]	[feet]	[feet]	[meters]
11/16/07 10:50 PM	890	170	810.04	0.93	0.28
11/16/07 10:55 PM	895	175	810.06	0.91	0.28
11/16/07 11:00 PM	900	180	810.09	0.88	0.27
11/16/07 11:05 PM	905	185	810.12	0.85	0.26
11/16/07 11:10 PM	910	190	810.15	0.82	0.25
11/16/07 11:15 PM	915	195	810.18	0.79	0.24
11/16/07 11:20 PM	920	200	810.21	0.76	0.23
11/16/07 11:25 PM	925	205	810.23	0.74	0.22
11/16/07 11:30 PM	930	210	810.26	0.71	0.22
11/16/07 11:35 PM	935	215	810.29	0.68	0.21
11/16/07 11:40 PM	940	220	810.32	0.65	0.20
11/16/07 11:45 PM	945	225	810.35	0.62	0.19
11/16/07 11:50 PM	950	230	810.37	0.60	0.18
11/16/07 11:55 PM	955	235	810.40	0.57	0.17
11/17/07 12:02 AM	960	242	810.65	0.32	0.10
11/17/07 1:02 AM	965	302	810.90	0.07	0.02
11/17/07 2:02 AM	970	362	811.15	-0.18	-0.06
11/17/07 3:02 AM	975	422	811.36	-0.39	-0.12
11/17/07 4:02 AM	980	482	811.48	-0.51	-0.16
11/17/07 5:02 AM	985	542	810.82	0.15	0.05
11/17/07 6:02 AM	990	602	810.41	0.56	0.17
11/17/07 7:02 AM	995	662	810.75	0.22	0.07
11/17/07 8:02 AM	1000	722	810.74	0.23	0.07
11/17/07 9:02 AM	1005	782	810.55	0.42	0.13
11/17/07 10:02 AM	1010	842	810.26	0.71	0.22
11/17/07 11:02 AM	1015	902	809.84	1.13	0.34
11/17/07 12:02 PM	1020	962	809.47	1.50	0.46

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 7:59 AM			812.78	0.22	0.07
11/16/07 8:04 AM	4		812.79	0.21	0.06
11/16/07 8:09 AM	9		812.82	0.18	0.06
11/16/07 8:14 AM	14		812.83	0.17	0.05
11/16/07 8:19 AM	19		812.84	0.16	0.05
11/16/07 8:24 AM	24		812.86	0.14	0.04
11/16/07 8:29 AM	29		812.88	0.12	0.04
11/16/07 8:34 AM	34		812.89	0.11	0.03
11/16/07 8:39 AM	39		812.91	0.09	0.03
11/16/07 8:44 AM	44		812.93	0.07	0.02
11/16/07 8:49 AM	49		812.95	0.05	0.02
11/16/07 8:54 AM	54		812.96	0.04	0.01
11/16/07 8:59 AM	59		812.97	0.03	0.01
11/16/07 9:04 AM	64		812.99	0.01	0.00
11/16/07 9:09 AM	69		813.01	-0.01	0.00
11/16/07 9:14 AM	74		813.02	-0.02	-0.01
11/16/07 9:19 AM	79		813.03	-0.03	-0.01
11/16/07 9:24 AM	84		813.03	-0.03	-0.01
11/16/07 9:29 AM	89		813.03	-0.03	-0.01
11/16/07 9:34 AM	94		813.03	-0.03	-0.01
11/16/07 9:39 AM	99		813.02	-0.02	-0.01
11/16/07 9:44 AM	104		813.01	-0.01	0.00
11/16/07 9:49 AM	109		813.00	0.00	0.00
11/16/07 9:54 AM	114		812.98	0.02	0.01
11/16/07 9:59 AM	119		812.96	0.04	0.01
11/16/07 10:04 AM	124		812.94	0.06	0.02
11/16/07 10:09 AM	129		812.92	0.08	0.03
11/16/07 10:14 AM	134		812.90	0.11	0.03
11/16/07 10:19 AM	139		812.87	0.13	0.04
11/16/07 10:24 AM	144		812.84	0.16	0.05
11/16/07 10:29 AM	149		812.82	0.18	0.06
11/16/07 10:34 AM	154		812.79	0.21	0.06
11/16/07 10:39 AM	159		812.76	0.24	0.07
11/16/07 10:44 AM	164		812.73	0.27	0.08

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 10:49 AM	169		812.70	0.30	0.09
11/16/07 10:54 AM	174		812.67	0.33	0.10
11/16/07 10:59 AM	179		812.65	0.35	0.11
11/16/07 11:04 AM	184		812.61	0.39	0.12
11/16/07 11:09 AM	189		812.59	0.41	0.13
11/16/07 11:14 AM	194		812.56	0.45	0.14
11/16/07 11:19 AM	199		812.53	0.48	0.14
11/16/07 11:24 AM	204		812.50	0.50	0.15
11/16/07 11:29 AM	209		812.47	0.53	0.16
11/16/07 11:34 AM	214		812.44	0.56	0.17
11/16/07 11:39 AM	219		812.41	0.59	0.18
11/16/07 11:44 AM	224		812.38	0.62	0.19
11/16/07 11:49 AM	229		812.36	0.64	0.20
11/16/07 11:54 AM	234		812.34	0.66	0.20
11/16/07 11:59 AM	239		812.31	0.69	0.21
11/16/07 12:04 PM	244		812.29	0.71	0.22
11/16/07 12:09 PM	249		812.27	0.73	0.22
11/16/07 12:14 PM	254		812.24	0.76	0.23
11/16/07 12:19 PM	259		812.22	0.78	0.24
11/16/07 12:24 PM	264		812.19	0.81	0.25
11/16/07 12:29 PM	269		812.17	0.84	0.25
11/16/07 12:34 PM	274		812.14	0.86	0.26
11/16/07 12:39 PM	279		812.12	0.88	0.27
11/16/07 12:44 PM	284		812.10	0.90	0.27
11/16/07 12:49 PM	289		812.08	0.92	0.28
11/16/07 12:54 PM	294		812.06	0.94	0.29
11/16/07 12:59 PM	299		812.03	0.97	0.29
11/16/07 1:04 PM	304		812.01	0.99	0.30
11/16/07 1:09 PM	309		811.98	1.02	0.31
11/16/07 1:14 PM	314		811.95	1.05	0.32
11/16/07 1:19 PM	319		811.94	1.06	0.32
11/16/07 1:24 PM	324		811.91	1.09	0.33
11/16/07 1:29 PM	329		811.89	1.11	0.34
11/16/07 1:34 PM	334		811.87	1.13	0.35

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 1:39 PM	339		811.85	1.15	0.35
11/16/07 1:44 PM	344		811.82	1.18	0.36
11/16/07 1:49 PM	349		811.80	1.20	0.37
11/16/07 1:54 PM	354		811.77	1.23	0.37
11/16/07 1:59 PM	359		811.75	1.25	0.38
11/16/07 2:04 PM	364		811.73	1.27	0.39
11/16/07 2:09 PM	369		811.71	1.29	0.39
11/16/07 2:14 PM	374		811.69	1.31	0.40
11/16/07 2:19 PM	379		811.67	1.33	0.40
11/16/07 2:24 PM	384		811.66	1.34	0.41
11/16/07 2:29 PM	389		811.64	1.36	0.41
11/16/07 2:34 PM	394		811.62	1.38	0.42
11/16/07 2:39 PM	399		811.61	1.39	0.42
11/16/07 2:44 PM	404		811.59	1.41	0.43
11/16/07 2:49 PM	409		811.57	1.43	0.43
11/16/07 2:54 PM	414		811.56	1.44	0.44
11/16/07 2:59 PM	419		811.54	1.46	0.44
11/16/07 3:04 PM	424		811.53	1.47	0.45
11/16/07 3:09 PM	429		811.52	1.49	0.45
11/16/07 3:14 PM	434		811.50	1.51	0.46
11/16/07 3:19 PM	439		811.49	1.51	0.46
11/16/07 3:24 PM	444		811.47	1.53	0.47
11/16/07 3:29 PM	449		811.45	1.55	0.47
11/16/07 3:34 PM	454		811.44	1.56	0.48
11/16/07 3:39 PM	459		811.42	1.58	0.48
11/16/07 3:44 PM	464		811.41	1.59	0.48
11/16/07 3:49 PM	469		811.39	1.61	0.49
11/16/07 3:54 PM	474		811.38	1.62	0.49
11/16/07 3:59 PM	479		811.36	1.64	0.50
11/16/07 4:04 PM	484		811.35	1.65	0.50
11/16/07 4:09 PM	489		811.33	1.67	0.51
11/16/07 4:14 PM	494		811.32	1.68	0.51
11/16/07 4:19 PM	499		811.30	1.70	0.52
11/16/07 4:24 PM	504		811.29	1.71	0.52

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 4:29 PM	509		811.28	1.72	0.52
11/16/07 4:34 PM	514		811.26	1.74	0.53
11/16/07 4:39 PM	519		811.25	1.75	0.53
11/16/07 4:44 PM	524		811.24	1.76	0.54
11/16/07 4:49 PM	529		811.22	1.78	0.54
11/16/07 4:54 PM	534		811.21	1.79	0.55
11/16/07 4:59 PM	539		811.20	1.80	0.55
11/16/07 5:04 PM	544		811.18	1.82	0.55
11/16/07 5:09 PM	549		811.17	1.83	0.56
11/16/07 5:14 PM	554		811.17	1.83	0.56
11/16/07 5:19 PM	559		811.16	1.85	0.56
11/16/07 5:24 PM	564		811.15	1.85	0.56
11/16/07 5:29 PM	569		811.14	1.86	0.57
11/16/07 5:34 PM	574		811.13	1.87	0.57
11/16/07 5:39 PM	579		811.12	1.88	0.57
11/16/07 5:44 PM	584		811.12	1.88	0.57
11/16/07 5:49 PM	589		811.11	1.89	0.58
11/16/07 5:54 PM	594		811.10	1.90	0.58
11/16/07 5:59 PM	599		811.09	1.91	0.58
11/16/07 6:04 PM	604		811.08	1.92	0.58
11/16/07 6:09 PM	609		811.08	1.92	0.59
11/16/07 6:14 PM	614		811.07	1.93	0.59
11/16/07 6:19 PM	619		811.06	1.94	0.59
11/16/07 6:24 PM	624		811.06	1.94	0.59
11/16/07 6:29 PM	629		811.05	1.95	0.60
11/16/07 6:34 PM	634		811.04	1.96	0.60
11/16/07 6:39 PM	639		811.03	1.97	0.60
11/16/07 6:44 PM	644		811.02	1.98	0.60
11/16/07 6:49 PM	649		811.01	1.99	0.61
11/16/07 6:54 PM	654		811.01	1.99	0.61
11/16/07 6:59 PM	659		811.00	2.00	0.61
11/16/07 7:04 PM	664		810.99	2.01	0.61
11/16/07 7:09 PM	669		810.98	2.02	0.62
11/16/07 7:14 PM	674		810.98	2.02	0.62

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 7:19 PM	679		810.97	2.03	0.62
11/16/07 7:24 PM	684		810.96	2.04	0.62
11/16/07 7:29 PM	689		810.96	2.04	0.62
11/16/07 7:34 PM	694		810.96	2.04	0.62
11/16/07 7:39 PM	699		810.95	2.05	0.63
11/16/07 7:44 PM	704		810.95	2.05	0.63
11/16/07 7:49 PM	709		810.94	2.06	0.63
11/16/07 7:54 PM	714		810.94	2.06	0.63
11/16/07 7:59 PM	719		810.93	2.07	0.63
11/16/07 8:04 PM	724	4	810.93	2.07	0.63
11/16/07 8:09 PM	729	9	810.93	2.07	0.63
11/16/07 8:14 PM	734	14	810.93	2.08	0.63
11/16/07 8:19 PM	739	19	810.92	2.08	0.63
11/16/07 8:24 PM	744	24	810.92	2.08	0.63
11/16/07 8:29 PM	749	29	810.92	2.08	0.63
11/16/07 8:34 PM	754	34	810.92	2.08	0.63
11/16/07 8:39 PM	759	39	810.92	2.09	0.64
11/16/07 8:44 PM	764	44	810.91	2.09	0.64
11/16/07 8:49 PM	769	49	810.91	2.09	0.64
11/16/07 8:54 PM	774	54	810.92	2.08	0.63
11/16/07 8:59 PM	779	59	810.91	2.09	0.64
11/16/07 9:04 PM	784	64	810.91	2.09	0.64
11/16/07 9:09 PM	789	69	810.91	2.09	0.64
11/16/07 9:14 PM	794	74	810.91	2.09	0.64
11/16/07 9:19 PM	799	79	810.91	2.09	0.64
11/16/07 9:24 PM	804	84	810.91	2.09	0.64
11/16/07 9:29 PM	809	89	810.92	2.08	0.63
11/16/07 9:34 PM	814	94	810.93	2.07	0.63
11/16/07 9:39 PM	819	99	810.94	2.06	0.63
11/16/07 9:44 PM	824	104	810.96	2.04	0.62
11/16/07 9:49 PM	829	109	810.99	2.01	0.61
11/16/07 9:54 PM	834	114	811.01	1.99	0.61
11/16/07 9:59 PM	839	119	811.04	1.96	0.60
11/16/07 10:04 PM	844	124	811.07	1.93	0.59

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/07 10:09 PM	849	129	811.10	1.90	0.58
11/16/07 10:14 PM	854	134	811.14	1.86	0.57
11/16/07 10:19 PM	859	139	811.17	1.83	0.56
11/16/07 10:24 PM	864	144	811.21	1.79	0.55
11/16/07 10:29 PM	869	149	811.25	1.75	0.53
11/16/07 10:34 PM	874	154	811.28	1.72	0.52
11/16/07 10:39 PM	879	159	811.32	1.68	0.51
11/16/07 10:44 PM	884	164	811.36	1.64	0.50
11/16/07 10:49 PM	889	169	811.39	1.61	0.49
11/16/07 10:54 PM	894	174	811.43	1.57	0.48
11/16/07 10:59 PM	899	179	811.47	1.53	0.47
11/16/07 11:04 PM	904	184	811.51	1.49	0.45
11/16/07 11:09 PM	909	189	811.55	1.45	0.44
11/16/07 11:14 PM	914	194	811.58	1.42	0.43
11/16/07 11:19 PM	919	199	811.62	1.38	0.42
11/16/07 11:24 PM	924	204	811.66	1.34	0.41
11/16/07 11:29 PM	929	209	811.69	1.31	0.40
11/16/07 11:34 PM	934	214	811.73	1.27	0.39
11/16/07 11:39 PM	939	219	811.77	1.23	0.38
11/16/07 11:44 PM	944	224	811.80	1.20	0.37
11/16/07 11:49 PM	949	229	811.83	1.17	0.36
11/16/07 11:54 PM	954	234	811.87	1.13	0.35
11/16/07 11:59 PM	959	239	811.90	1.10	0.34
11/17/07 12:04 AM	964	244	811.93	1.07	0.33
11/17/07 12:09 AM	969	249	811.96	1.04	0.32
11/17/07 12:14 AM	974	254	811.99	1.01	0.31
11/17/07 12:19 AM	979	259	812.03	0.97	0.30
11/17/07 12:24 AM	984	264	812.06	0.94	0.29
11/17/07 12:29 AM	989	269	812.09	0.91	0.28
11/17/07 12:34 AM	994	274	812.12	0.88	0.27
11/17/07 12:39 AM	999	279	812.15	0.85	0.26
11/17/07 12:44 AM	1004	284	812.18	0.83	0.25
11/17/07 12:49 AM	1009	289	812.20	0.80	0.24
11/17/07 12:54 AM	1014	294	812.23	0.77	0.23

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/17/07 12:59 AM	1019	299	812.26	0.74	0.23
11/17/07 1:04 AM	1024	304	812.29	0.71	0.22
11/17/07 1:09 AM	1029	309	812.32	0.68	0.21
11/17/07 1:14 AM	1034	314	812.35	0.65	0.20
11/17/07 1:19 AM	1039	319	812.38	0.62	0.19
11/17/07 1:24 AM	1044	324	812.41	0.59	0.18
11/17/07 1:29 AM	1049	329	812.44	0.56	0.17
11/17/07 1:34 AM	1054	334	812.46	0.54	0.16
11/17/07 1:39 AM	1059	339	812.49	0.51	0.16
11/17/07 1:44 AM	1064	344	812.52	0.48	0.15
11/17/07 1:49 AM	1069	349	812.55	0.46	0.14
11/17/07 1:54 AM	1074	354	812.57	0.43	0.13
11/17/07 1:59 AM	1079	359	812.60	0.40	0.12
11/17/07 2:04 AM	1084	364	812.62	0.38	0.12
11/17/07 2:09 AM	1089	369	812.64	0.36	0.11
11/17/07 2:14 AM	1094	374	812.67	0.33	0.10
11/17/07 2:19 AM	1099	379	812.69	0.31	0.09
11/17/07 2:24 AM	1104	384	812.72	0.28	0.09
11/17/07 2:29 AM	1109	389	812.74	0.26	0.08
11/17/07 2:34 AM	1114	394	812.76	0.24	0.07
11/17/07 2:39 AM	1119	399	812.79	0.21	0.06
11/17/07 2:44 AM	1124	404	812.81	0.19	0.06
11/17/07 2:49 AM	1129	409	812.84	0.16	0.05
11/17/07 2:54 AM	1134	414	812.86	0.14	0.04
11/17/07 2:59 AM	1139	419	812.88	0.12	0.04
11/17/07 3:04 AM	1144	424	812.90	0.10	0.03
11/17/07 3:09 AM	1149	429	812.93	0.07	0.02
11/17/07 3:14 AM	1154	434	812.95	0.05	0.02
11/17/07 3:19 AM	1159	439	812.97	0.03	0.01
11/17/07 3:24 AM	1164	444	812.99	0.01	0.00
11/17/07 3:29 AM	1169	449	813.01	-0.01	0.00
11/17/07 3:34 AM	1174	454	813.03	-0.03	-0.01
11/17/07 3:39 AM	1179	459	813.06	-0.06	-0.02
11/17/07 3:44 AM	1184	464	813.07	-0.07	-0.02

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/17/07 3:49 AM	1189	469	813.09	-0.09	-0.03
11/17/07 3:54 AM	1194	474	813.11	-0.11	-0.03
11/17/07 3:59 AM	1199	479	813.13	-0.13	-0.04
11/17/07 4:04 AM	1204	484	813.15	-0.15	-0.04
11/17/07 4:09 AM	1209	489	813.16	-0.16	-0.05
11/17/07 4:14 AM	1214	494	813.18	-0.18	-0.06
11/17/07 4:19 AM	1219	499	813.21	-0.21	-0.06
11/17/07 4:24 AM	1224	504	813.22	-0.22	-0.07
11/17/07 4:29 AM	1229	509	813.24	-0.24	-0.07
11/17/07 4:34 AM	1234	514	813.26	-0.26	-0.08
11/17/07 4:39 AM	1239	519	813.28	-0.28	-0.08
11/17/07 4:44 AM	1244	524	813.30	-0.30	-0.09
11/17/07 4:49 AM	1249	529	813.32	-0.32	-0.10
11/17/07 4:54 AM	1254	534	813.34	-0.34	-0.10
11/17/07 4:59 AM	1259	539	813.35	-0.35	-0.11
11/17/07 5:04 AM	1264	544	813.37	-0.37	-0.11
11/17/07 5:09 AM	1269	549	813.40	-0.39	-0.12
11/17/07 5:14 AM	1274	554	813.41	-0.41	-0.13
11/17/07 5:19 AM	1279	559	813.43	-0.43	-0.13
11/17/07 5:24 AM	1284	564	813.45	-0.45	-0.14
11/17/07 5:29 AM	1289	569	813.46	-0.46	-0.14
11/17/07 5:34 AM	1294	574	813.48	-0.48	-0.15
11/17/07 5:39 AM	1299	579	813.50	-0.50	-0.15
11/17/07 5:44 AM	1304	584	813.52	-0.52	-0.16
11/17/07 5:49 AM	1309	589	813.53	-0.53	-0.16
11/17/07 5:54 AM	1314	594	813.55	-0.55	-0.17
11/17/07 5:59 AM	1319	599	813.56	-0.56	-0.17
11/17/07 6:04 AM	1324	604	813.58	-0.58	-0.18
11/17/07 6:09 AM	1329	609	813.59	-0.59	-0.18
11/17/07 6:14 AM	1334	614	813.60	-0.60	-0.18
11/17/07 6:19 AM	1339	619	813.62	-0.62	-0.19
11/17/07 6:24 AM	1344	624	813.63	-0.63	-0.19
11/17/07 6:29 AM	1349	629	813.64	-0.64	-0.20
11/17/07 6:34 AM	1354	634	813.65	-0.65	-0.20

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/17/07 6:39 AM	1359	639	813.66	-0.66	-0.20
11/17/07 6:44 AM	1364	644	813.67	-0.67	-0.20
11/17/07 6:49 AM	1369	649	813.68	-0.68	-0.21
11/17/07 6:54 AM	1374	654	813.69	-0.69	-0.21
11/17/07 6:59 AM	1379	659	813.70	-0.70	-0.21
11/17/07 7:04 AM	1384	664	813.71	-0.71	-0.22
11/17/07 7:09 AM	1389	669	813.72	-0.72	-0.22
11/17/07 7:14 AM	1394	674	813.72	-0.72	-0.22
11/17/07 7:19 AM	1399	679	813.73	-0.73	-0.22
11/17/07 7:24 AM	1404	684	813.73	-0.73	-0.22
11/17/07 7:29 AM	1409	689	813.73	-0.73	-0.22
11/17/07 7:34 AM	1414	694	813.74	-0.74	-0.22
11/17/07 7:39 AM	1419	699	813.74	-0.74	-0.22
11/17/07 7:44 AM	1424	704	813.74	-0.74	-0.22
11/17/07 7:49 AM	1429	709	813.74	-0.74	-0.22
11/17/07 7:54 AM	1434	714	813.74	-0.74	-0.22
11/17/07 7:59 AM	1439	719	813.74	-0.74	-0.22
11/17/07 8:04 AM	1444	724	813.74	-0.74	-0.22
11/17/07 8:09 AM	1449	729	813.74	-0.74	-0.22
11/17/07 8:14 AM	1454	734	813.74	-0.74	-0.22
11/17/07 8:19 AM	1459	739	813.73	-0.73	-0.22
11/17/07 8:24 AM	1464	744	813.73	-0.73	-0.22
11/17/07 8:29 AM	1469	749	813.73	-0.73	-0.22
11/17/07 8:34 AM	1474	754	813.73	-0.73	-0.22
11/17/07 8:39 AM	1479	759	813.73	-0.73	-0.22
11/17/07 8:44 AM	1484	764	813.73	-0.73	-0.22
11/17/07 8:49 AM	1489	769	813.73	-0.73	-0.22
11/17/07 8:54 AM	1494	774	813.72	-0.72	-0.22
11/17/07 8:59 AM	1499	779	813.72	-0.72	-0.22
11/17/07 9:04 AM	1504	784	813.72	-0.72	-0.22
11/17/07 9:09 AM	1509	789	813.72	-0.72	-0.22
11/17/07 9:14 AM	1514	794	813.72	-0.72	-0.22
11/17/07 9:19 AM	1519	799	813.72	-0.72	-0.22
11/17/07 9:24 AM	1524	804	813.72	-0.72	-0.22

**Table 2-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Meadowbrook Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/17/07 9:29 AM	1529	809	813.72	-0.72	-0.22
11/17/07 9:34 AM	1534	814	813.72	-0.72	-0.22
11/17/07 9:39 AM	1539	819	813.72	-0.72	-0.22
11/17/07 9:44 AM	1544	824	813.72	-0.72	-0.22
11/17/07 9:49 AM	1549	829	813.72	-0.72	-0.22
11/17/07 9:54 AM	1554	834	813.71	-0.71	-0.22
11/17/07 9:59 AM	1559	839	813.71	-0.71	-0.22
11/17/07 10:04 AM	1564	844	813.71	-0.71	-0.21
11/17/07 10:09 AM	1569	849	813.70	-0.70	-0.21
11/17/07 10:14 AM	1574	854	813.70	-0.70	-0.21
11/17/07 10:19 AM	1579	859	813.69	-0.69	-0.21
11/17/07 10:24 AM	1584	864	813.68	-0.68	-0.21
11/17/07 10:29 AM	1589	869	813.68	-0.68	-0.21
11/17/07 10:34 AM	1594	874	813.67	-0.67	-0.20
11/17/07 10:39 AM	1599	879	813.67	-0.67	-0.20
11/17/07 10:44 AM	1604	884	813.66	-0.66	-0.20
11/17/07 10:49 AM	1609	889	813.66	-0.66	-0.20
11/17/07 10:54 AM	1614	894	813.65	-0.65	-0.20
11/17/07 10:59 AM	1619	899	813.65	-0.65	-0.20
11/17/07 11:04 AM	1624	904	813.64	-0.64	-0.19
11/17/07 11:09 AM	1629	909	813.63	-0.63	-0.19
11/17/07 11:14 AM	1634	914	813.63	-0.63	-0.19
11/17/07 11:19 AM	1639	919	813.62	-0.62	-0.19
11/17/07 11:24 AM	1644	924	813.62	-0.62	-0.19
11/17/07 11:29 AM	1649	929	813.61	-0.61	-0.19
11/17/07 11:34 AM	1654	934	813.61	-0.61	-0.19
11/17/07 11:39 AM	1659	939	813.61	-0.61	-0.19
11/17/07 11:44 AM	1664	944	813.60	-0.60	-0.18
11/17/07 11:49 AM	1669	949	813.60	-0.60	-0.18
11/17/07 11:54 AM	1674	954	813.59	-0.59	-0.18
11/17/07 11:59 AM	1679	959	813.59	-0.59	-0.18

**Table 3-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina OPCJ Test Well Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/2007 8:00	0		811.42	0.00	0.00
11/16/2007 8:03	3		811.42	0.00	0.00
11/16/2007 8:29	29		811.42	0.00	0.00
11/16/2007 8:37	37		811.38	0.04	0.01
11/16/2007 9:04	64		811.29	0.13	0.04
11/16/2007 9:40	100		811.14	0.28	0.09
11/16/2007 9:50	110		811.10	0.32	0.10
11/16/2007 10:22	142		810.95	0.47	0.14
11/16/2007 10:47	167		811.02	0.40	0.12
11/16/2007 11:36	216		810.73	0.69	0.21
11/16/2007 11:44	224		810.62	0.80	0.24
11/16/2007 12:02	242		810.56	0.86	0.26
11/16/2007 12:05	245		810.55	0.87	0.27
11/16/2007 12:48	288		810.27	1.15	0.35
11/16/2007 13:01	301		810.27	1.15	0.35
11/16/2007 13:05	305		809.47	1.95	0.59
11/16/2007 13:10	310		809.45	1.97	0.60
11/16/2007 13:15	315		809.43	1.99	0.61
11/16/2007 13:20	320		809.40	2.02	0.62
11/16/2007 13:25	325		809.38	2.04	0.62
11/16/2007 13:30	330		809.37	2.05	0.63
11/16/2007 13:35	335		809.31	2.11	0.64
11/16/2007 13:40	340		809.30	2.12	0.65
11/16/2007 13:45	345		809.29	2.13	0.65
11/16/2007 13:50	350		809.27	2.15	0.65
11/16/2007 13:55	355		809.25	2.17	0.66
11/16/2007 14:00	360		809.24	2.18	0.66
11/16/2007 14:05	365		809.21	2.21	0.67
11/16/2007 14:10	370		809.20	2.22	0.68
11/16/2007 14:15	375		809.18	2.24	0.68
11/16/2007 14:20	380		809.17	2.25	0.69
11/16/2007 14:25	385		809.15	2.27	0.69
11/16/2007 14:30	390		809.14	2.28	0.70
11/16/2007 14:35	395		809.12	2.30	0.70

**Table 3-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina OPCJ Test Well Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/2007 14:40	400		809.11	2.31	0.70
11/16/2007 14:45	405		809.10	2.32	0.71
11/16/2007 14:50	410		809.08	2.34	0.71
11/16/2007 14:55	415		809.06	2.36	0.72
11/16/2007 15:00	420		809.07	2.35	0.72
11/16/2007 15:05	425		809.05	2.37	0.72
11/16/2007 15:10	430		809.03	2.39	0.73
11/16/2007 15:15	435		809.03	2.39	0.73
11/16/2007 15:20	440		809.01	2.41	0.74
11/16/2007 15:25	445		809.00	2.42	0.74
11/16/2007 15:30	450		808.99	2.43	0.74
11/16/2007 15:35	455		808.97	2.45	0.75
11/16/2007 15:40	460		808.96	2.46	0.75
11/16/2007 15:45	465		808.95	2.47	0.75
11/16/2007 15:50	470		808.96	2.46	0.75
11/16/2007 15:55	475		808.93	2.49	0.76
11/16/2007 16:00	480		808.93	2.50	0.76
11/16/2007 16:05	485		808.91	2.51	0.76
11/16/2007 16:10	490		808.91	2.51	0.76
11/16/2007 16:15	495		808.88	2.54	0.77
11/16/2007 16:20	500		808.89	2.53	0.77
11/16/2007 16:25	505		808.87	2.55	0.78
11/16/2007 16:30	510		808.88	2.54	0.77
11/16/2007 16:35	515		808.86	2.56	0.78
11/16/2007 16:40	520		808.86	2.56	0.78
11/16/2007 16:45	525		808.86	2.56	0.78
11/16/2007 16:50	530		808.85	2.57	0.78
11/16/2007 16:55	535		808.84	2.58	0.79
11/16/2007 17:00	540		808.83	2.59	0.79
11/16/2007 17:05	545		808.84	2.58	0.79
11/16/2007 17:10	550		808.83	2.59	0.79
11/16/2007 17:15	555		808.83	2.59	0.79
11/16/2007 17:20	560		808.81	2.61	0.79
11/16/2007 17:25	565		808.82	2.60	0.79

**Table 3-A. Edina Well 7 Groundwater VOC Contamination  
STS Project No. 200703587  
Aquifer Test Performed on November 16, 2007  
Edina OPCJ Test Well Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulativ e Time (pump test) [min]	Cumulativ e Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/2007 17:30	570		808.81	2.61	0.80
11/16/2007 17:35	575		808.80	2.62	0.80
11/16/2007 17:40	580		808.80	2.62	0.80
11/16/2007 17:45	585		808.81	2.62	0.80
11/16/2007 17:50	590		808.79	2.63	0.80
11/16/2007 17:55	595		808.79	2.63	0.80
11/16/2007 18:00	600		808.79	2.63	0.80
11/16/2007 18:05	605		808.78	2.64	0.81
11/16/2007 18:10	610		808.78	2.64	0.81
11/16/2007 18:15	615		808.77	2.65	0.81
11/16/2007 18:20	620		808.76	2.66	0.81
11/16/2007 18:25	625		808.76	2.66	0.81
11/16/2007 18:30	630		808.76	2.66	0.81
11/16/2007 18:35	635		808.76	2.66	0.81
11/16/2007 18:40	640		808.75	2.67	0.82
11/16/2007 18:45	645		808.75	2.67	0.81
11/16/2007 18:50	650		808.75	2.67	0.81
11/16/2007 18:55	655		808.74	2.68	0.82
11/16/2007 19:00	660		808.74	2.68	0.82
11/16/2007 19:05	665		808.74	2.68	0.82
11/16/2007 19:10	670		808.73	2.69	0.82
11/16/2007 19:15	675		808.72	2.70	0.82
11/16/2007 19:20	680		808.72	2.70	0.82
11/16/2007 19:25	685		808.72	2.70	0.82
11/16/2007 19:30	690		808.72	2.70	0.82
11/16/2007 19:35	695		808.71	2.71	0.83
11/16/2007 19:40	700		808.72	2.70	0.82
11/16/2007 19:45	705		808.72	2.70	0.82
11/16/2007 19:50	710		808.72	2.70	0.82
11/16/2007 19:55	715		808.71	2.71	0.83
11/16/2007 20:00	720	0	808.71	2.71	0.83
11/16/2007 20:05	725	5	808.73	2.69	0.82
11/16/2007 20:10	730	10	808.71	2.71	0.82
11/16/2007 20:15	735	15	808.73	2.69	0.82

**Table 3-A. Edina Well 7 Groundwater VOC Contamination  
STS Project No. 200703587  
Aquifer Test Performed on November 16, 2007  
Edina OPCJ Test Well Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/2007 20:20	740	20	808.73	2.69	0.82
11/16/2007 20:25	745	25	808.76	2.66	0.81
11/16/2007 20:30	750	30	808.77	2.65	0.81
11/16/2007 20:35	755	35	808.79	2.63	0.80
11/16/2007 20:40	760	40	808.80	2.62	0.80
11/16/2007 20:45	765	45	808.82	2.60	0.79
11/16/2007 20:50	770	50	808.84	2.58	0.79
11/16/2007 20:55	775	55	808.86	2.56	0.78
11/16/2007 21:00	780	60	808.88	2.54	0.77
11/16/2007 21:05	785	65	808.92	2.50	0.76
11/16/2007 21:10	790	70	808.95	2.47	0.75
11/16/2007 21:15	795	75	808.96	2.46	0.75
11/16/2007 21:20	800	80	809.01	2.41	0.74
11/16/2007 21:25	805	85	809.02	2.40	0.73
11/16/2007 21:30	810	90	809.04	2.38	0.73
11/16/2007 21:35	815	95	809.06	2.36	0.72
11/16/2007 21:40	820	100	809.11	2.31	0.70
11/16/2007 21:45	825	105	809.14	2.28	0.70
11/16/2007 21:50	830	110	809.17	2.26	0.69
11/16/2007 21:55	835	115	809.19	2.23	0.68
11/16/2007 22:00	840	120	809.22	2.20	0.67
11/16/2007 22:05	845	125	809.25	2.17	0.66
11/16/2007 22:10	850	130	809.27	2.15	0.66
11/16/2007 22:15	855	135	809.29	2.13	0.65
11/16/2007 22:20	860	140	809.34	2.08	0.64
11/16/2007 22:25	865	145	809.36	2.06	0.63
11/16/2007 22:30	870	150	809.39	2.03	0.62
11/16/2007 22:35	875	155	809.42	2.00	0.61
11/16/2007 22:40	880	160	809.45	1.97	0.60
11/16/2007 22:45	885	165	809.47	1.95	0.59
11/16/2007 22:50	890	170	809.49	1.93	0.59
11/16/2007 22:55	895	175	809.52	1.90	0.58
11/16/2007 23:00	900	180	809.56	1.86	0.57
11/16/2007 23:05	905	185	809.58	1.84	0.56

**Table 3-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina OPCJ Test Well Water Level Data**

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 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/16/2007 23:10	910	190	809.60	1.82	0.56
11/16/2007 23:15	915	195	809.62	1.80	0.55
11/16/2007 23:20	920	200	809.65	1.77	0.54
11/16/2007 23:25	925	205	809.68	1.74	0.53
11/16/2007 23:30	930	210	809.70	1.72	0.52
11/16/2007 23:35	935	215	809.72	1.70	0.52
11/16/2007 23:40	940	220	809.74	1.68	0.51
11/16/2007 23:45	945	225	809.77	1.65	0.50
11/16/2007 23:50	950	230	809.79	1.63	0.50
11/16/2007 23:55	955	235	809.81	1.61	0.49
11/17/2007 0:00	960	240	809.84	1.58	0.48
11/17/2007 0:05	965	245	809.85	1.57	0.48
11/17/2007 0:10	970	250	809.85	1.57	0.48
11/17/2007 0:15	975	255	809.88	1.54	0.47
11/17/2007 0:20	980	260	809.91	1.51	0.46
11/17/2007 0:25	985	265	809.93	1.49	0.45
11/17/2007 0:30	990	270	809.95	1.47	0.45
11/17/2007 0:35	995	275	809.98	1.44	0.44
11/17/2007 0:40	1000	280	809.99	1.43	0.44
11/17/2007 0:45	1005	285	810.03	1.39	0.42
11/17/2007 0:50	1010	290	810.04	1.38	0.42
11/17/2007 0:55	1015	295	810.06	1.36	0.41
11/17/2007 1:00	1020	300	810.08	1.34	0.41
11/17/2007 1:05	1025	305	810.10	1.32	0.40
11/17/2007 1:10	1030	310	810.14	1.28	0.39
11/17/2007 1:15	1035	315	810.15	1.27	0.39
11/17/2007 1:20	1040	320	810.17	1.25	0.38
11/17/2007 1:25	1045	325	810.19	1.23	0.38
11/17/2007 1:30	1050	330	810.21	1.21	0.37
11/17/2007 1:35	1055	335	810.23	1.19	0.36
11/17/2007 1:40	1060	340	810.26	1.16	0.35
11/17/2007 1:45	1065	345	810.27	1.15	0.35
11/17/2007 1:50	1070	350	810.28	1.14	0.35
11/17/2007 1:55	1075	355	810.32	1.10	0.33

**Table 3-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina OPCJ Test Well Water Level Data**

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 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/17/2007 2:00	1080	360	810.33	1.09	0.33
11/17/2007 2:05	1085	365	810.34	1.08	0.33
11/17/2007 2:10	1090	370	810.38	1.04	0.32
11/17/2007 2:15	1095	375	810.39	1.03	0.31
11/17/2007 2:20	1100	380	810.41	1.01	0.31
11/17/2007 2:25	1105	385	810.44	0.98	0.30
11/17/2007 2:30	1110	390	810.46	0.96	0.29
11/17/2007 2:35	1115	395	810.47	0.95	0.29
11/17/2007 2:40	1120	400	810.49	0.93	0.28
11/17/2007 2:45	1125	405	810.52	0.90	0.27
11/17/2007 2:50	1130	410	810.53	0.89	0.27
11/17/2007 2:55	1135	415	810.52	0.90	0.27
11/17/2007 3:00	1140	420	810.57	0.85	0.26
11/17/2007 3:05	1145	425	810.58	0.84	0.26
11/17/2007 3:10	1150	430	810.59	0.83	0.25
11/17/2007 3:15	1155	435	810.62	0.80	0.24
11/17/2007 3:20	1160	440	810.62	0.80	0.25
11/17/2007 3:25	1165	445	810.65	0.77	0.23
11/17/2007 3:30	1170	450	810.67	0.75	0.23
11/17/2007 3:35	1175	455	810.68	0.74	0.23
11/17/2007 3:40	1180	460	810.70	0.72	0.22
11/17/2007 3:45	1185	465	810.72	0.70	0.21
11/17/2007 3:50	1190	470	810.73	0.69	0.21
11/17/2007 3:55	1195	475	810.75	0.67	0.20
11/17/2007 4:00	1200	480	810.76	0.66	0.20
11/17/2007 4:05	1205	485	810.78	0.64	0.19
11/17/2007 4:10	1210	490	810.80	0.62	0.19
11/17/2007 4:15	1215	495	810.81	0.61	0.19
11/17/2007 4:20	1220	500	810.81	0.61	0.18
11/17/2007 4:25	1225	505	810.82	0.60	0.18
11/17/2007 4:30	1230	510	810.82	0.60	0.18
11/17/2007 4:35	1235	515	810.82	0.60	0.18
11/17/2007 4:40	1240	520	810.83	0.59	0.18
11/17/2007 4:45	1245	525	810.82	0.60	0.18

**Table 3-A. Edina Well 7 Groundwater VOC Contamination  
STS Project No. 200703587  
Aquifer Test Performed on November 16, 2007  
Edina OPCJ Test Well Water Level Data**

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Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/17/2007 4:50	1250	530	810.82	0.60	0.18
11/17/2007 4:55	1255	535	810.81	0.61	0.19
11/17/2007 5:00	1260	540	810.81	0.61	0.19
11/17/2007 5:05	1265	545	810.79	0.63	0.19
11/17/2007 5:10	1270	550	810.80	0.63	0.19
11/17/2007 5:15	1275	555	810.79	0.63	0.19
11/17/2007 5:20	1280	560	810.78	0.64	0.19
11/17/2007 5:25	1285	565	810.78	0.64	0.20
11/17/2007 5:30	1290	570	810.76	0.66	0.20
11/17/2007 5:35	1295	575	810.75	0.67	0.20
11/17/2007 5:40	1300	580	810.73	0.69	0.21
11/17/2007 5:45	1305	585	810.71	0.71	0.22
11/17/2007 5:50	1310	590	810.71	0.71	0.22
11/17/2007 5:55	1315	595	810.68	0.74	0.22
11/17/2007 6:00	1320	600	810.68	0.74	0.23
11/17/2007 6:05	1325	605	810.67	0.75	0.23
11/17/2007 6:10	1330	610	810.67	0.75	0.23
11/17/2007 6:15	1335	615	810.65	0.77	0.24
11/17/2007 6:20	1340	620	810.64	0.78	0.24
11/17/2007 6:25	1345	625	810.64	0.78	0.24
11/17/2007 6:30	1350	630	810.64	0.78	0.24
11/17/2007 6:35	1355	635	810.62	0.80	0.24
11/17/2007 6:40	1360	640	810.64	0.78	0.24
11/17/2007 6:45	1365	645	810.62	0.80	0.25
11/17/2007 6:50	1370	650	810.63	0.79	0.24
11/17/2007 6:55	1375	655	810.61	0.81	0.25
11/17/2007 7:00	1380	660	810.61	0.81	0.25
11/17/2007 7:05	1385	665	810.63	0.79	0.24
11/17/2007 7:10	1390	670	810.61	0.81	0.25
11/17/2007 7:15	1395	675	810.62	0.80	0.24
11/17/2007 7:20	1400	680	810.61	0.81	0.25
11/17/2007 7:25	1405	685	810.60	0.82	0.25
11/17/2007 7:30	1410	690	810.58	0.84	0.26
11/17/2007 7:35	1415	695	810.58	0.84	0.26

**Table 3-A. Edina Well 7 Groundwater VOC Contamination  
STS Project No. 200703587  
Aquifer Test Performed on November 16, 2007  
Edina OPCJ Test Well Water Level Data**

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Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulativ e Time (pump test)	Cumulativ e Time (recovery test)	Edina OPCJ Test Well		
			Water Elevation	Drawdown	Drawdown
			[min]	[feet]	[meters]
11/17/2007 7:40	1420	700	810.60	0.82	0.25
11/17/2007 7:45	1425	705	810.59	0.83	0.25
11/17/2007 7:50	1430	710	810.58	0.84	0.26
11/17/2007 7:55	1435	715	810.57	0.85	0.26
11/17/2007 8:00	1440	720	810.57	0.85	0.26
11/17/2007 8:05	1445	725	810.56	0.87	0.26
11/17/2007 8:10	1450	730	810.55	0.87	0.26
11/17/2007 8:15	1455	735	810.54	0.88	0.27
11/17/2007 8:20	1460	740	810.54	0.88	0.27
11/17/2007 8:25	1465	745	810.52	0.90	0.28
11/17/2007 8:30	1470	750	810.51	0.91	0.28
11/17/2007 8:35	1475	755	810.52	0.90	0.28
11/17/2007 8:40	1480	760	810.50	0.92	0.28
11/17/2007 8:45	1485	765	810.48	0.94	0.29
11/17/2007 8:50	1490	770	810.47	0.95	0.29
11/17/2007 8:55	1495	775	810.47	0.95	0.29
11/17/2007 9:00	1500	780	810.45	0.97	0.29
11/17/2007 9:05	1505	785	810.46	0.96	0.29
11/17/2007 9:10	1510	790	810.44	0.98	0.30
11/17/2007 9:15	1515	795	810.43	0.99	0.30
11/17/2007 9:20	1520	800	810.41	1.01	0.31
11/17/2007 9:25	1525	805	810.40	1.02	0.31
11/17/2007 9:30	1530	810	810.41	1.01	0.31
11/17/2007 9:35	1535	815	810.39	1.03	0.31
11/17/2007 9:40	1540	820	810.37	1.05	0.32
11/17/2007 9:45	1545	825	810.35	1.07	0.33
11/17/2007 9:50	1550	830	810.34	1.08	0.33
11/17/2007 9:55	1555	835	810.31	1.11	0.34
11/17/2007 10:00	1560	840	810.28	1.14	0.35
11/17/2007 10:05	1565	845	810.26	1.16	0.35
11/17/2007 10:10	1570	850	810.26	1.16	0.35
11/17/2007 10:15	1575	855	810.23	1.19	0.36
11/17/2007 10:20	1580	860	810.20	1.22	0.37
11/17/2007 10:24	1584	864	809.74	1.68	0.51

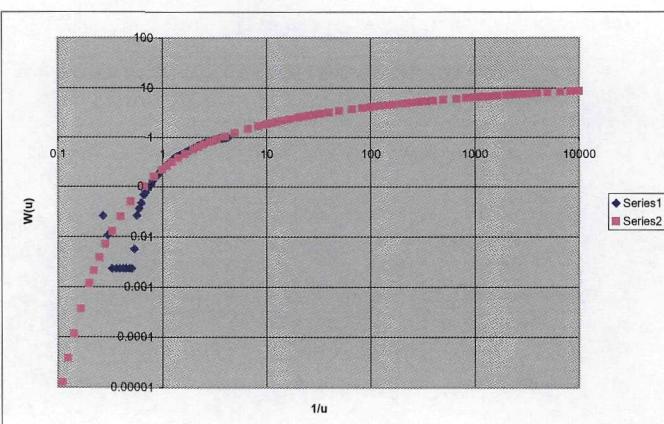
**Table 3-A. Edina Well 7 Groundwater VOC Contamination**  
**STS Project No. 200703587**  
**Aquifer Test Performed on November 16, 2007**  
**Edina OPCJ Test Well Water Level Data**

The City of Edina Well No. 15 was pumped for 12 hours at the rate of 950 gpm  
 Water levels were measured in the Edina Municipal Well No. 7 (ED-7), Edina  
 OPCJ Test Well and the Meadowbrook Golf Course Well

Date, Time	Cumulative Time (pump test) [min]	Cumulative Time (recovery test) [min]	Edina OPCJ Test Well		
			Water Elevation [feet]	Drawdown [feet]	Drawdown [meters]
11/17/2007 10:25	1585	865	810.18	1.24	0.38
11/17/2007 10:30	1590	870	810.15	1.27	0.39
11/17/2007 10:35	1595	875	810.12	1.30	0.40
11/17/2007 10:40	1600	880	810.09	1.33	0.40
11/17/2007 10:45	1605	885	810.08	1.34	0.41
11/17/2007 10:50	1610	890	810.05	1.37	0.42
11/17/2007 10:55	1615	895	810.02	1.40	0.43
11/17/2007 11:00	1620	900	810.00	1.42	0.43
11/17/2007 11:05	1625	905	809.97	1.45	0.44
11/17/2007 11:10	1630	910	809.95	1.47	0.45
11/17/2007 11:15	1635	915	809.92	1.50	0.46
11/17/2007 11:20	1640	920	809.90	1.52	0.46
11/17/2007 11:25	1645	925	809.87	1.55	0.47
11/17/2007 11:30	1650	930	809.86	1.56	0.47
11/17/2007 11:35	1655	935	809.84	1.58	0.48
11/17/2007 11:40	1660	940	809.80	1.62	0.49
11/17/2007 11:45	1665	945	809.79	1.63	0.50
11/17/2007 11:50	1670	950	809.76	1.66	0.51
11/17/2007 11:55	1675	955	809.73	1.69	0.52
11/17/2007 12:00	1680	960	809.72	1.70	0.52

**Table 4-A**  
STS Project No. 200703587

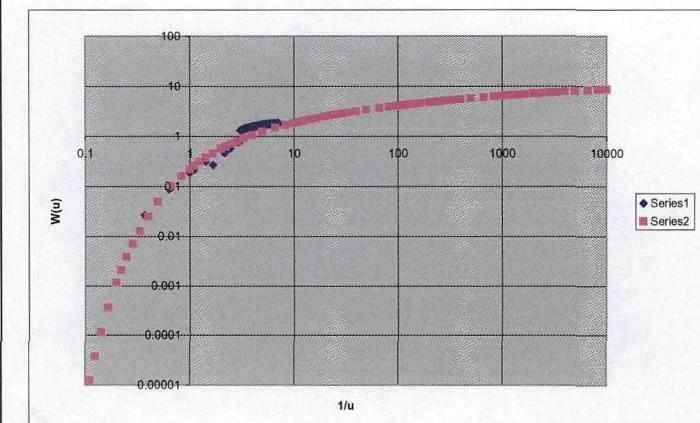
Curve fitting procedure.				THEIS METHOD AQUIFER TEST DATA ANALYSIS Confined aquifer, unsteady-state flow.			
Displacement X factor: 6.00E-03				STS Consultants, Ltd., December 2004 "Theis 1.xls" spreadsheet by Piotr Rzepecki Source: Kruseman, G.P. & Ridder, N.A. Analysis and Evaluation of Pumping Test Data. ILRI, 1991, pp.61-65.			
Displacement Y factor: 2.30E+00							
5							
t (min)	dd (m)	shifted data coordinates					
0	0.001	0.0E+00	0.00	Project : Edina Well 7 Groundwater VOC Contamination Analyst : Piotr Rzepecki Test Date : 11/16/2007 Well : ED-15 Pumping, ED-7 dd data			
45	0.011	2.7E-01	0.03	File name: Theis ED-7.xls			
50	0.005	3.0E-01	0.01				
55	0.001	3.3E-01	0.00				
60	0.001	3.6E-01	0.00				
65	0.001	3.9E-01	0.00				
70	0.001	4.2E-01	0.00				
75	0.001	4.5E-01	0.00	r = 1200.000 [m] rw = 0.50 [ft] (prod. well eff. radius) Q = 3.5960 [m³/min] rc = 0.40 [ft] (pump-column pipe radius) D = 67.00 [m]			
80	0.001	4.8E-01	0.00	1/u = 10 ts = 1 [min] (well storage cap. imp. negl.) (W.C. Walton, 1989, p. 3)			
85	0.001	5.1E-01	0.00	t = 1666.666667 [min] W(u) = 1 = 1 [min]			
90	0.002	5.4E-01	0.01	(Papadopoulos and Cooper, 1967)			
95	0.011	5.7E-01	0.03				
100	0.016	6.0E-01	0.04				
105	0.020	6.3E-01	0.05				
110	0.029	6.6E-01	0.07				
115	0.034	6.9E-01	0.08	KD = 0.65817 [m²/min] S = 3.05E-01 [-]			
120	0.040	7.2E-01	0.09	7.1E+00 [ft²/min] 948 [m²/day]			
125	0.045	7.5E-01	0.10	76322 [gpd/ft]			
130	0.049	7.8E-01	0.11	K = 1.6E-02 [cm/sec]			
135	0.058	8.1E-01	0.13				
140	0.062	8.4E-01	0.14				
145	0.069	8.7E-01	0.16				
150	0.076	9.0E-01	0.17				
155	0.080	9.3E-01	0.18				
160	0.089	9.6E-01	0.20				
165	0.096	9.9E-01	0.22				
170	0.102	1.0E+00	0.24				
175	0.109	1.1E+00	0.25				
180	0.113	1.1E+00	0.26				
185	0.120	1.1E+00	0.28				
190	0.127	1.1E+00	0.29				
195	0.131	1.2E+00	0.30				
200	0.140	1.2E+00	0.32				
205	0.145	1.2E+00	0.33				
210	0.156	1.3E+00	0.36				
215	0.160	1.3E+00	0.37				
220	0.167	1.3E+00	0.38				
225	0.171	1.4E+00	0.39				
230	0.176	1.4E+00	0.40				
235	0.180	1.4E+00	0.41				
240	0.183	1.4E+00	0.42				
245	0.185	1.5E+00	0.42				
250	0.189	1.5E+00	0.44				
255	0.196	1.5E+00	0.45				
260	0.198	1.6E+00	0.46				
265	0.202	1.6E+00	0.47				
270	0.209	1.6E+00	0.48				
275	0.209	1.7E+00	0.48				
280	0.216	1.7E+00	0.50				
285	0.220	1.7E+00	0.51				
290	0.225	1.7E+00	0.52				
295	0.227	1.8E+00	0.52				
300	0.231	1.8E+00	0.53				
305	0.236	1.8E+00	0.54				
310	0.240	1.9E+00	0.55				
315	0.243	1.9E+00	0.56				
320	0.247	1.9E+00	0.57				
325	0.251	2.0E+00	0.58				
330	0.258	2.0E+00	0.59				
335	0.260	2.0E+00	0.60				
340	0.265	2.0E+00	0.61				
345	0.269	2.1E+00	0.62				
350	0.274	2.1E+00	0.63				
355	0.280	2.1E+00	0.64				
360	0.287	2.2E+00	0.66				
365	0.289	2.2E+00	0.67				
370	0.291	2.2E+00	0.67				
375	0.296	2.3E+00	0.68				
380	0.298	2.3E+00	0.69				
385	0.303	2.3E+00	0.70				
390	0.307	2.3E+00	0.71				
395	0.309	2.4E+00	0.71				
400	0.312	2.4E+00	0.72				
405	0.316	2.4E+00	0.73				
410	0.320	2.5E+00	0.74				
415	0.325	2.5E+00	0.75				
420	0.327	2.5E+00	0.75				
425	0.329	2.6E+00	0.76				



- input data cells

**Table 5-A**  
STS Project No. 200703587

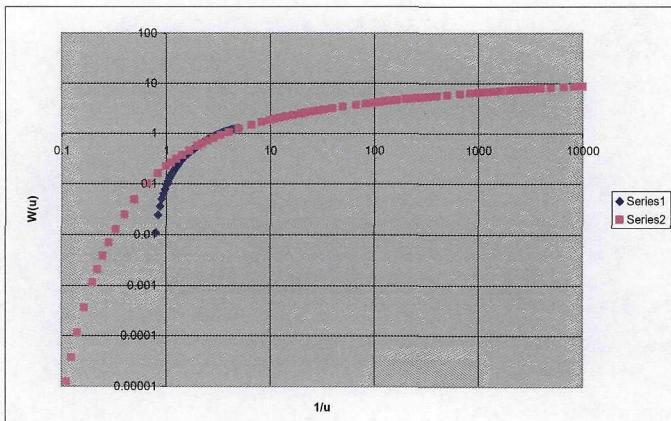
Curve fitting procedure.			THEIS METHOD AQUIFER TEST DATA ANALYSIS Confined aquifer, unsteady-state flow.		
Displacement X factor: 1.00E-02			STS Consultants, Ltd., December 2004 "Theis 1.xls" spreadsheet by Piotr Rzepecki Source: Kruseman,G.P. & Ridder,N.A. Analysis and Evaluation of Pumping Test Data. ILRI, 1991, pp.61-65.		
Displacement Y factor: 2.20E+00					
shifted data coordinates					
t (min)	dd (m)		Project : Edina Well 7 Groundwater VOC Contamination	File name: Theis ED-Test.xls	
37	0.012	3.7E-01	Analyst : Piotr Rzepecki		
64	0.040	6.4E-01	Test Date : 11/16/2007		
100	0.085	1.0E+00	Well : ED-15 Pumping, ED Test Well dd data		
110	0.098	1.1E+00			
142	0.143	1.4E+00			
167	0.122	1.7E+00			
216	0.210	2.2E+00			
224	0.244	2.2E+00			
242	0.262	2.4E+00			
245	0.265	2.5E+00			
288	0.350	2.9E+00			
301	0.350	3.0E+00			
305	0.594	3.1E+00			
310	0.601	3.1E+00			
315	0.606	3.2E+00			
320	0.615	3.2E+00			
325	0.623	3.3E+00			
330	0.625	3.3E+00			
335	0.642	3.4E+00			
340	0.647	3.4E+00			
345	0.650	3.5E+00			
350	0.654	3.5E+00			
355	0.662	3.6E+00			
360	0.664	3.6E+00			
365	0.674	3.7E+00			
370	0.677	3.7E+00			
375	0.682	3.8E+00			
380	0.685	3.8E+00			
385	0.691	3.9E+00			
390	0.696	3.9E+00			
395	0.702	4.0E+00			
400	0.704	4.0E+00			
405	0.709	4.1E+00			
410	0.714	4.1E+00			
415	0.720	4.2E+00			
420	0.717	4.2E+00			
425	0.723	4.3E+00			
430	0.727	4.3E+00			
435	0.728	4.4E+00			
440	0.736	4.4E+00			
445	0.738	4.5E+00			
450	0.741	4.5E+00			
455	0.748	4.6E+00			
460	0.750	4.6E+00			
465	0.752	4.7E+00			
470	0.750	4.7E+00			
475	0.759	4.8E+00			
480	0.760	4.8E+00			
485	0.764	4.9E+00			
490	0.764	4.9E+00			
495	0.773	5.0E+00			
500	0.770	5.0E+00			
505	0.776	5.1E+00			
510	0.774	5.1E+00			
515	0.780	5.2E+00			
520	0.780	5.2E+00			
525	0.781	5.3E+00			
530	0.784	5.3E+00			
535	0.786	5.4E+00			
540	0.789	5.4E+00			
545	0.785	5.5E+00			
550	0.790	5.5E+00			
555	0.791	5.6E+00			
560	0.794	5.6E+00			
565	0.793	5.7E+00			
570	0.796	5.7E+00			
575	0.800	5.8E+00			
580	0.798	5.8E+00			
585	0.797	5.9E+00			
590	0.803	5.9E+00			
595	0.802	6.0E+00			
600	0.803	6.0E+00			
605	0.805	6.1E+00			
610	0.805	6.1E+00			
615	0.808	6.2E+00			
620	0.810	6.2E+00			
625	0.811	6.3E+00			
630	0.812	6.3E+00			



- input data cells

**Table 6-A**  
**STS Project No. 200703587**

Curve fitting procedure.			THEIS METHOD AQUIFER TEST DATA ANALYSIS Confined aquifer, unsteady-state flow.		
Displacement X factor: 7.00E-03			STS Consultants, Ltd., December 2004 "Theis 1.xls" spreadsheet by Piotr Rzepecki Source: Kruseman,G.P. & Ridder,N.A. Analysis and Evaluation of Pumping Test Data. ILRI, 1991, pp.61-65.		
Displacement Y factor: 2.00E+00					
			Project : Edina Well 7 Groundwater VOC Contamination Analyst : Piotr Rzepecki Test Date : 11/16/2007 Well : ED-15 Pumping, Meadowbrook Well dd data		
			File name: Theis ED-7.xls		
(min)	dd (m)	shifted data coordinates	r = 1350.000 [m]	rw = 0.50 [ft] (prod. well eff. radius)	
114	0.005	8.0E-01 0.01	Q = 3.5960 [m³/min]	rc = 0.40 [ft] (pump-column pipe radius)	
119	0.012	8.3E-01 0.02	D = 67.00 [m]		
124	0.018	8.7E-01 0.04	1/u = 10	ts = 1 [min] (well storage cap. imp. negl.)	
129	0.025	9.0E-01 0.05	t = 1428.571429 [min]	('W.C. Walton, 1989, p. 3)	
134	0.032	9.4E-01 0.06	W(u) = 1	= 1 [min]	
139	0.039	9.7E-01 0.08	dd = 0.5 [m]	(Papadopoulos and Cooper, 1967)	
144	0.048	1.0E+00 0.10	KD = 0.57232 [m²/min]	S = 2.27E-01 [-]	
149	0.056	1.0E+00 0.11	6.2E+00 [ft²/min]		
154	0.064	1.1E+00 0.13	824 [m²/day]		
159	0.073	1.1E+00 0.15	66367 [gpd/ft]		
164	0.082	1.1E+00 0.16	K = 1.4E-02 [cm/sec]		
169	0.091	1.2E+00 0.18			
174	0.099	1.2E+00 0.20			
179	0.107	1.3E+00 0.21			
184	0.118	1.3E+00 0.24			
189	0.126	1.3E+00 0.25			
194	0.136	1.4E+00 0.27			
199	0.145	1.4E+00 0.29			
204	0.153	1.4E+00 0.31			
209	0.162	1.5E+00 0.32			
214	0.170	1.5E+00 0.34			
219	0.179	1.5E+00 0.36			
224	0.188	1.6E+00 0.38			
229	0.195	1.6E+00 0.39			
234	0.202	1.6E+00 0.40			
239	0.210	1.7E+00 0.42			
244	0.216	1.7E+00 0.43			
249	0.223	1.7E+00 0.45			
254	0.231	1.8E+00 0.46			
259	0.238	1.8E+00 0.48			
264	0.246	1.8E+00 0.49			
269	0.255	1.9E+00 0.51			
274	0.261	1.9E+00 0.52			
279	0.268	2.0E+00 0.54			
284	0.274	2.0E+00 0.55			
289	0.281	2.0E+00 0.56			
294	0.288	2.1E+00 0.58			
299	0.294	2.1E+00 0.59			
304	0.303	2.1E+00 0.61			
309	0.311	2.2E+00 0.62			
314	0.319	2.2E+00 0.64			
319	0.324	2.2E+00 0.65			
324	0.331	2.3E+00 0.66			
329	0.339	2.3E+00 0.68			
334	0.346	2.3E+00 0.69			
339	0.351	2.4E+00 0.70			
344	0.360	2.4E+00 0.72			
349	0.367	2.4E+00 0.73			
354	0.374	2.5E+00 0.75			
359	0.380	2.5E+00 0.76			
364	0.386	2.5E+00 0.77			
369	0.393	2.6E+00 0.79			
374	0.398	2.6E+00 0.80			
379	0.404	2.7E+00 0.81			
384	0.410	2.7E+00 0.82			
389	0.415	2.7E+00 0.83			
394	0.420	2.8E+00 0.84			
399	0.425	2.8E+00 0.85			
404	0.430	2.8E+00 0.86			
409	0.435	2.9E+00 0.87			
414	0.439	2.9E+00 0.88			
419	0.445	2.9E+00 0.89			
424	0.448	3.0E+00 0.90			
429	0.453	3.0E+00 0.91			
434	0.459	3.0E+00 0.92			
439	0.462	3.1E+00 0.92			
444	0.466	3.1E+00 0.93			
449	0.471	3.1E+00 0.94			
454	0.475	3.2E+00 0.95			
459	0.480	3.2E+00 0.96			
464	0.485	3.2E+00 0.97			
469	0.490	3.3E+00 0.98			
474	0.493	3.3E+00 0.99			
479	0.499	3.4E+00 1.00			
484	0.504	3.4E+00 1.01			
489	0.509	3.4E+00 1.02			
494	0.512	3.5E+00 1.02			
499	0.517	3.5E+00 1.03			



- input data cells

Table 7-A

STS Project No. 200703587

## THEIS'S RECOVERY METHOD OF ANALYSING AQUIFER TEST DATA

STS Consultants, Ltd, December 2004

"Theis Recovery 1.xls" spreadsheet by Piotr Rzepecki

Source: Kruseman &amp; Verweij, 1991, pp. 194-196

TIME [min]	t [day]	t' [day]	t/t'	corr. dd. (aq. dew.)	corr. dd. (atm. press.)	Log(t/t')	Regr. Line	Project : Edina Well 7 Groundwater VOC Conta	File name: Theis Recovery, ED-7.xls
				(s) [ft]	(s') [m]				
0.001	0.50	0.00	715001.00	0.44	5.85	5.42			
5	0.50	0.00	144.00	0.44	2.16	1.73			
10	0.50	0.01	72.50	0.44	1.86	1.43			
15	0.51	0.01	48.67	0.44	1.69	1.26			
20	0.51	0.01	36.75	0.44	1.57	1.14			
25	0.51	0.02	29.60	0.44	1.47	1.04			
30	0.52	0.02	24.83	0.44	1.40	0.97			
35	0.52	0.02	21.43	0.44	1.33	0.90			
40	0.52	0.03	18.88	0.44	1.28	0.85			
45	0.53	0.03	16.89	0.44	1.23	0.80			
50	0.53	0.03	15.30	0.44	1.18	0.75			
55	0.53	0.04	14.00	0.44	1.15	0.72			
60	0.54	0.04	12.92	0.44	1.11	0.68			
65	0.54	0.05	12.00	0.44	1.08	0.65			
70	0.55	0.05	11.21	0.43	1.05	0.62			
75	0.55	0.05	10.53	0.43	1.02	0.59			
80	0.55	0.06	9.94	0.42	1.00	0.57			
85	0.56	0.06	9.41	0.42	0.97	0.54			
90	0.56	0.06	8.94	0.41	0.95	0.52			
95	0.56	0.07	8.53	0.41	0.93	0.50			
100	0.57	0.07	8.15	0.40	0.91	0.48			
105	0.57	0.07	7.81	0.39	0.89	0.46			
110	0.57	0.08	7.50	0.38	0.88	0.45			
115	0.58	0.08	7.22	0.38	0.86	0.43			
120	0.58	0.08	6.96	0.37	0.84	0.41			
125	0.58	0.09	6.72	0.36	0.83	0.40			
130	0.59	0.09	6.50	0.35	0.81	0.38			
135	0.59	0.09	6.30	0.35	0.80	0.37			
140	0.59	0.10	6.11	0.34	0.79	0.36			
145	0.60	0.10	5.93	0.33	0.77	0.34			
150	0.60	0.10	5.77	0.32	0.76	0.33			
155	0.60	0.11	5.61	0.31	0.75	0.32			
160	0.61	0.11	5.47	0.30	0.74	0.31			
165	0.61	0.11	5.33	0.29	0.73	0.30			
170	0.61	0.12	5.21	0.28	0.72	0.29			
175	0.62	0.12	5.09	0.28	0.71	0.28			
180	0.62	0.13	4.97	0.27	0.70	0.27			
185	0.63	0.13	4.86	0.26	0.69	0.26			
190	0.63	0.13	4.76	0.25	0.68	0.25			
195	0.63	0.14	4.67	0.24	0.67	0.24			
200	0.64	0.14	4.58	0.23	0.66	0.23			
205	0.64	0.14	4.49	0.22	0.65	0.22			
210	0.64	0.15	4.40	0.22	0.64	0.21			
215	0.65	0.15	4.33	0.21	0.64	0.21			
220	0.65	0.15	4.25	0.20	0.63	0.20			
225	0.65	0.16	4.18	0.19	0.62	0.19			
230	0.66	0.16	4.11	0.18	0.61	0.18			
235	0.66	0.16	4.04	0.17	0.61	0.18			
242	0.66	0.17	3.95	0.10	0.60	0.17			
302	0.71	0.21	3.37	0.02	0.53	0.10			

Regression Line Fitting:  
Constant -4.30E-01  
X Coefficient(s) 1

Table 8-A

STS Project No. 200703587

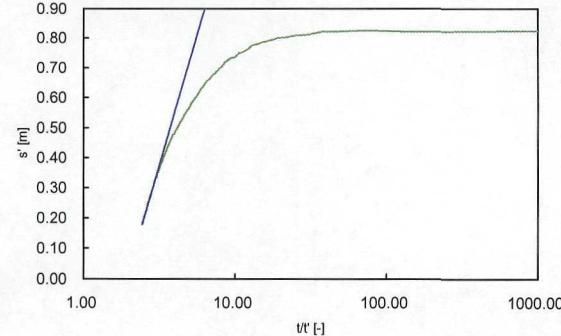
## THEIS'S RECOVERY METHOD OF ANALYSING AQUIFER TEST DATA

STS Consultants, Ltd, December 2004

"Theis Recovery 1.xls" spreadsheet by Piotr Rzepecki

Source: Kruseman &amp; Verweij, 1991, pp. 194-196

TIME [min]	t [day]	t' [day]	t/t' [-]	corr. dd. (aq. dew.) (s) [ft]	corr. dd. (atm. press.) (s') [m]	Log(t/t') Regr. Line	Project : Edina Well 7 Groundwater VOC Conta File name: Theis Recovery. ED-7.xls
0.1	0.50	0.00	7201.00	0.83	3.86	6.25	Analyst : P. Rzepecki
5	0.50	0.00	145.00	0.82	2.16	3.28	Test Date : 0.0003426
10	0.51	0.01	73.00	0.82	1.86	2.76	Well : ED15 pumping, ED OPCJ Test Well dd data
15	0.51	0.01	49.00	0.82	1.69	2.46	
20	0.51	0.01	37.00	0.82	1.57	2.24	
25	0.52	0.02	29.80	0.81	1.47	2.08	t of Pump Test : 0.50 [day]
30	0.52	0.02	25.00	0.81	1.40	1.95	Q : 5178.00 [m³/day]
35	0.52	0.02	21.57	0.80	1.33	1.83	D : 67 [m]
40	0.53	0.03	19.00	0.80	1.28	1.74	delta s': 1.75 [m/log cycle]
45	0.53	0.03	17.00	0.79	1.23	1.65	KD : 541.55 [m²/day]
50	0.53	0.03	15.40	0.79	1.19	1.58	4.0E+00 [ft²/min]
55	0.54	0.04	14.09	0.78	1.15	1.51	43610 [gpd/ft]
60	0.54	0.04	13.00	0.77	1.11	1.45	K : 9.3E-03 [cm/sec]
65	0.55	0.05	12.08	0.76	1.08	1.39	
70	0.55	0.05	11.29	0.75	1.05	1.34	
75	0.55	0.05	10.60	0.75	1.03	1.29	Regression Line Fitting:
80	0.56	0.06	10.00	0.74	1.00	1.25	Constant : -0.5
85	0.56	0.06	9.47	0.73	0.98	1.21	X Coefficient(s) : 1.75
90	0.56	0.06	9.00	0.73	0.95	1.17	
95	0.57	0.07	8.58	0.72	0.93	1.13	
100	0.57	0.07	8.20	0.70	0.91	1.10	
105	0.57	0.07	7.86	0.70	0.90	1.07	
110	0.58	0.08	7.55	0.69	0.88	1.04	
115	0.58	0.08	7.26	0.68	0.86	1.01	
120	0.58	0.08	7.00	0.67	0.85	0.98	
125	0.59	0.09	6.76	0.66	0.83	0.95	
130	0.59	0.09	6.54	0.66	0.82	0.93	
135	0.59	0.09	6.33	0.65	0.80	0.90	
140	0.60	0.10	6.14	0.64	0.79	0.88	
145	0.60	0.10	5.97	0.63	0.78	0.86	
150	0.60	0.10	5.80	0.62	0.76	0.84	
155	0.61	0.11	5.65	0.61	0.75	0.82	
160	0.61	0.11	5.50	0.60	0.74	0.80	
165	0.61	0.11	5.36	0.59	0.73	0.78	
170	0.62	0.12	5.24	0.59	0.72	0.76	
175	0.62	0.12	5.11	0.58	0.71	0.74	
180	0.63	0.13	5.00	0.57	0.70	0.72	
185	0.63	0.13	4.89	0.56	0.69	0.71	
190	0.63	0.13	4.79	0.56	0.68	0.69	
195	0.64	0.14	4.69	0.55	0.67	0.67	
200	0.64	0.14	4.60	0.54	0.66	0.66	
205	0.64	0.14	4.51	0.53	0.65	0.65	
210	0.65	0.15	4.43	0.52	0.65	0.63	
215	0.65	0.15	4.35	0.52	0.64	0.62	
220	0.65	0.15	4.27	0.51	0.63	0.60	
225	0.66	0.16	4.20	0.50	0.62	0.59	
230	0.66	0.16	4.13	0.50	0.62	0.58	
235	0.66	0.16	4.06	0.49	0.61	0.57	
240	0.67	0.17	4.00	0.48	0.60	0.55	
245	0.67	0.17	3.94	0.48	0.60	0.54	
250	0.67	0.17	3.88	0.48	0.59	0.53	



**Table 9-A**  
STS Project No. 200703587

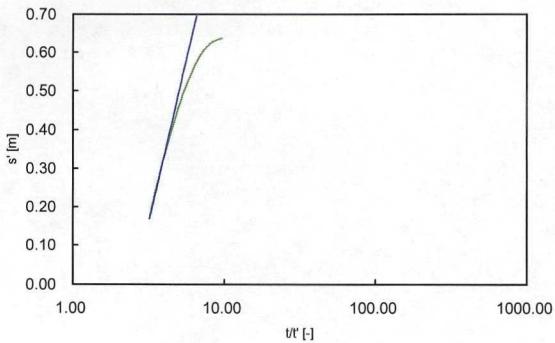
THEIS'S RECOVERY METHOD OF ANALYSING AQUIFER TEST DATA

STS Consultants, Ltd, December 2004

"Theis Recovery 1.xls" spreadsheet by Piotr Rzepecki

Source: Kruseman & Verweij, 1991, pp. 194-196

TIME [min]	t [day]	t' [day]	t/t' [-]	corr. dd. (aq. dew.)	corr. dd. (atm. press.)	Regr. Line	Project : Edina Well 7 Groundwater VOC Conta File name: Theis Recovery, ED-7.xls	
				(s) [ft]	(s') [m]		Analyst : P. Rzepecki	Test Date : 0.0003426
84	0.56	0.06	9.62	0.64	0.98	0.98	t of Pump Test : 0.50 [day]	
89	0.56	0.06	9.13	0.63	0.96	0.94	Q : 5178.00 [m³/day]	
94	0.57	0.07	8.70	0.63	0.94	0.91	D : 67 [m]	
99	0.57	0.07	8.31	0.63	0.92	0.87	delta s': 1.70 [m/log cycle]	
104	0.58	0.07	7.96	0.62	0.90	0.84	KD : 557.48 [m²/day]	
109	0.58	0.08	7.64	0.61	0.88	0.81	4.2E+00 [ft²/min]	
114	0.58	0.08	7.35	0.61	0.87	0.78	44893 [gpd/ft]	
119	0.59	0.08	7.08	0.60	0.85	0.76	K : 9.6E-03 [cm/sec]	
124	0.59	0.09	6.84	0.59	0.83	0.73		
129	0.59	0.09	6.61	0.58	0.82	0.70		
134	0.60	0.09	6.40	0.57	0.81	0.68		
139	0.60	0.10	6.21	0.56	0.79	0.66		
144	0.60	0.10	6.03	0.55	0.78	0.64		
149	0.61	0.10	5.86	0.53	0.77	0.62		
154	0.61	0.11	5.70	0.52	0.76	0.60		
159	0.61	0.11	5.55	0.51	0.74	0.58		
164	0.62	0.11	5.41	0.50	0.73	0.56		
169	0.62	0.12	5.28	0.49	0.72	0.54		
174	0.62	0.12	5.16	0.48	0.71	0.52		
179	0.63	0.12	5.04	0.47	0.70	0.50		
184	0.63	0.13	4.93	0.45	0.69	0.49		
189	0.63	0.13	4.83	0.44	0.68	0.47		
194	0.64	0.13	4.73	0.43	0.68	0.46		
199	0.64	0.14	4.64	0.42	0.67	0.44		
204	0.64	0.14	4.55	0.41	0.66	0.43		
209	0.65	0.15	4.46	0.40	0.65	0.41		
214	0.65	0.15	4.38	0.39	0.64	0.40		
219	0.65	0.15	4.31	0.38	0.63	0.39		
224	0.66	0.16	4.23	0.37	0.63	0.38		
229	0.66	0.16	4.16	0.36	0.62	0.36		
234	0.67	0.16	4.09	0.35	0.61	0.35		
239	0.67	0.17	4.03	0.34	0.61	0.34		
244	0.67	0.17	3.97	0.33	0.60	0.33		
249	0.68	0.17	3.91	0.32	0.59	0.32		
254	0.68	0.18	3.85	0.31	0.59	0.31		
259	0.68	0.18	3.80	0.30	0.58	0.29		
264	0.69	0.18	3.74	0.29	0.57	0.28		
269	0.69	0.19	3.69	0.28	0.57	0.27		
274	0.69	0.19	3.64	0.27	0.56	0.26		
279	0.70	0.19	3.59	0.26	0.56	0.25		
284	0.70	0.20	3.55	0.25	0.55	0.25		
289	0.70	0.20	3.51	0.24	0.54	0.24		
294	0.71	0.20	3.46	0.23	0.54	0.23		
299	0.71	0.21	3.42	0.23	0.53	0.22		
304	0.71	0.21	3.38	0.22	0.53	0.21		
309	0.72	0.21	3.34	0.21	0.52	0.20		
314	0.72	0.22	3.31	0.20	0.52	0.19		
319	0.72	0.22	3.27	0.19	0.51	0.18		
324	0.73	0.23	3.23	0.18	0.51	0.18		
329	0.73	0.23	3.20	0.17	0.51	0.17		



**Table 3-3 Aquifer Test Data and Derivation of K Values for the Model Layer 3  
Representing the Prairie du Chien / Jordan Aquifer System**

Well Name	MN Unique Well No.	UTME	UTMN	PDCJ Thickness (ft)	PDCJ Transmissivity		K for model input cm/sec	Model Zone	PDCJ Transmissivity		K for model input cm/sec	Model Zone	PDCJ Transmissivity		K for model input cm/sec	Model Zone
					(gpd/ft)	(m <sup>2</sup> /day)			(gpd/ft)	(m <sup>2</sup> /day)			(gpd/ft)	(m <sup>2</sup> /day)		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
					Median / Preferred Value				Maximum Value in a Range				Minimum Value in a Range			
City of Bloomington #2	0000222911	472367	4964588	82	221408	2749	4.82E-02		409156	5081	8.91E-02		147356	1830	3.21E-02	
Hennepin Co. Lake Level #3	0000206924	457161	4981988	88	83600	1038	1.82E-02									
Oakwood Elementary School	0000204636	460644	4982741	129	54978	683	1.20E-02									
Eden Prairie #9	0000424926	462803	4969236	154	51373	638	1.12E-02									
Plymouth 5	0000160023	462962	4983518	169	80784	1003	1.76E-02		129030	1602	2.81E-02	Zone 18	80784	1003	1.76E-02	Zone 18
City of Minnetonka #6A	0000208012	467217	4977553	181	17952	223	3.91E-03		33660	418	7.33E-03	Zone 13	17652	219	3.84E-03	Zone 13
Eden Prairie #7	0000424924	462558	4968554	199	16374	203	3.57E-03									
Northwest Orient (MAC)	0000208324	484006	4969490	205	140000	1739	3.05E-02									
Metro Airport Commission, Well #2	0000208321	483683	4970035	206	115780	1438	2.52E-02									
City of Minnetonka #16A	0000661401	463236	4976840	208	92752	1152	2.02E-02		165532	2056	3.60E-02	Zone 17	46376	576	1.01E-02	Zone 17
Lutheran Bible Inst.	0000203930	471732	4981152	210	54000	671	1.18E-02									
City of Minnetonka #10	0000204140	463477	4976644	213	67245	835	1.46E-02		73828	917	1.61E-02		65749	816	1.43E-02	
Metro Airport Commission, Well #1	0000208322	483690	4970017	218	72850	905	1.59E-02									
Eden Prairie 2	0000205905	463838	4967435	224	88264	1096	1.92E-02		92752	1152	2.02E-02	Zone 16	71284	885	1.55E-02	Zone 16
Eden Prairie #8	0000424925	462875	4968837	225	46329	575	1.01E-02									
City of Edina #3	0000240630	473882	4972728	231	109956	1365	2.39E-02		148029	1838	3.22E-02	Zone 14	18999	236	4.14E-03	Zone 14
City of Edina #6 (STS quick test)	0000200564	472600	4971537	215	269016	3341	5.86E-02		311472	3868	6.78E-02		269016	3341	5.86E-02	

Modeled thickness of the PDCJ Aquifer is 66 m

Assumptions: Kx = Ky; Kz = 1/100 x Kx

## Appendix B

### Downhole Geophysical Logging Results - Hydrolab Profiling

Figure 1. Water Quality Indicator Parameters -- Hydrolab Sonde  
Depth Profile -- Edina Test Well (748656)  
January 2, 2007 (red); November 15, 2007 (blue)

Note: Profile measured under static  
(unpumped) conditions.

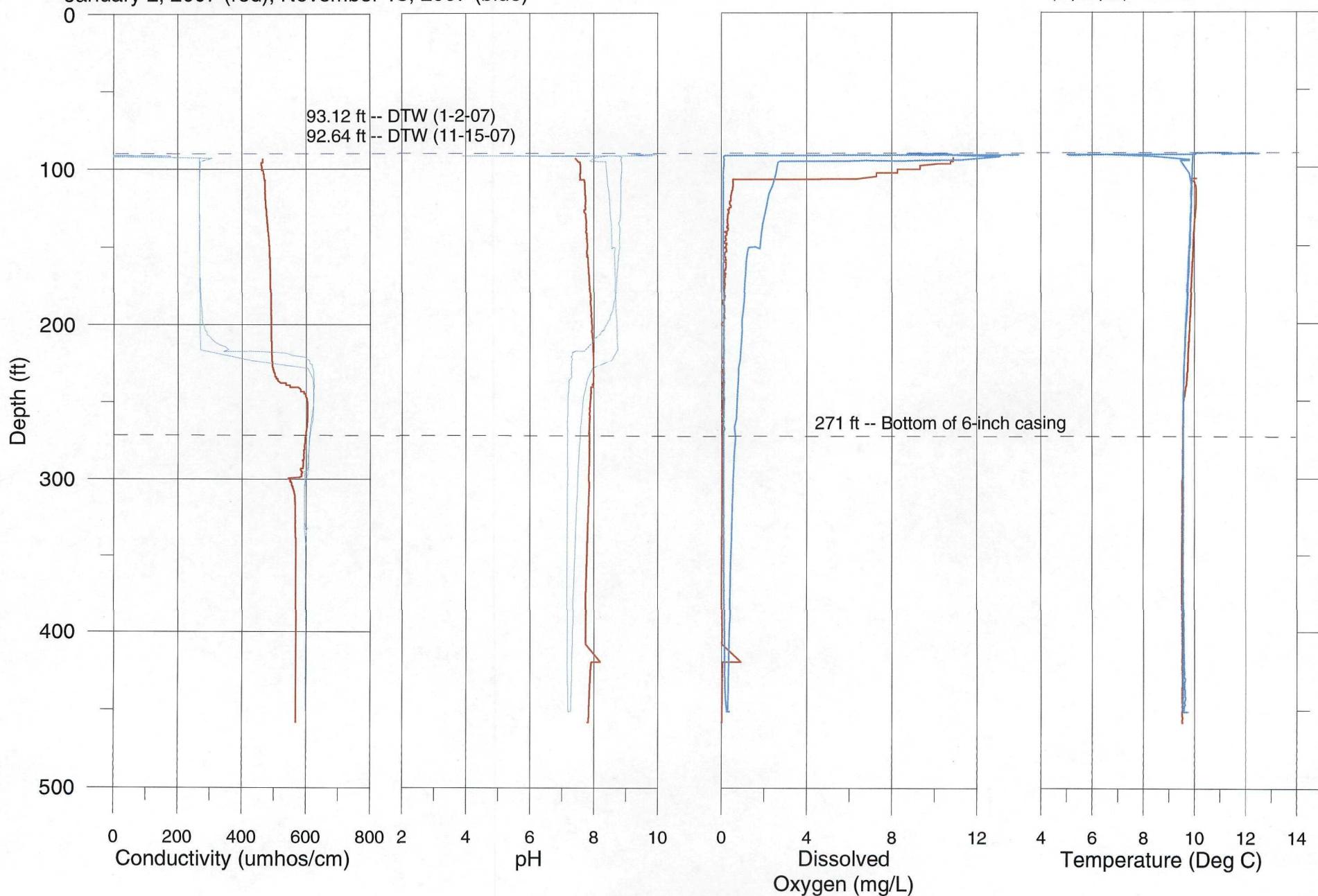
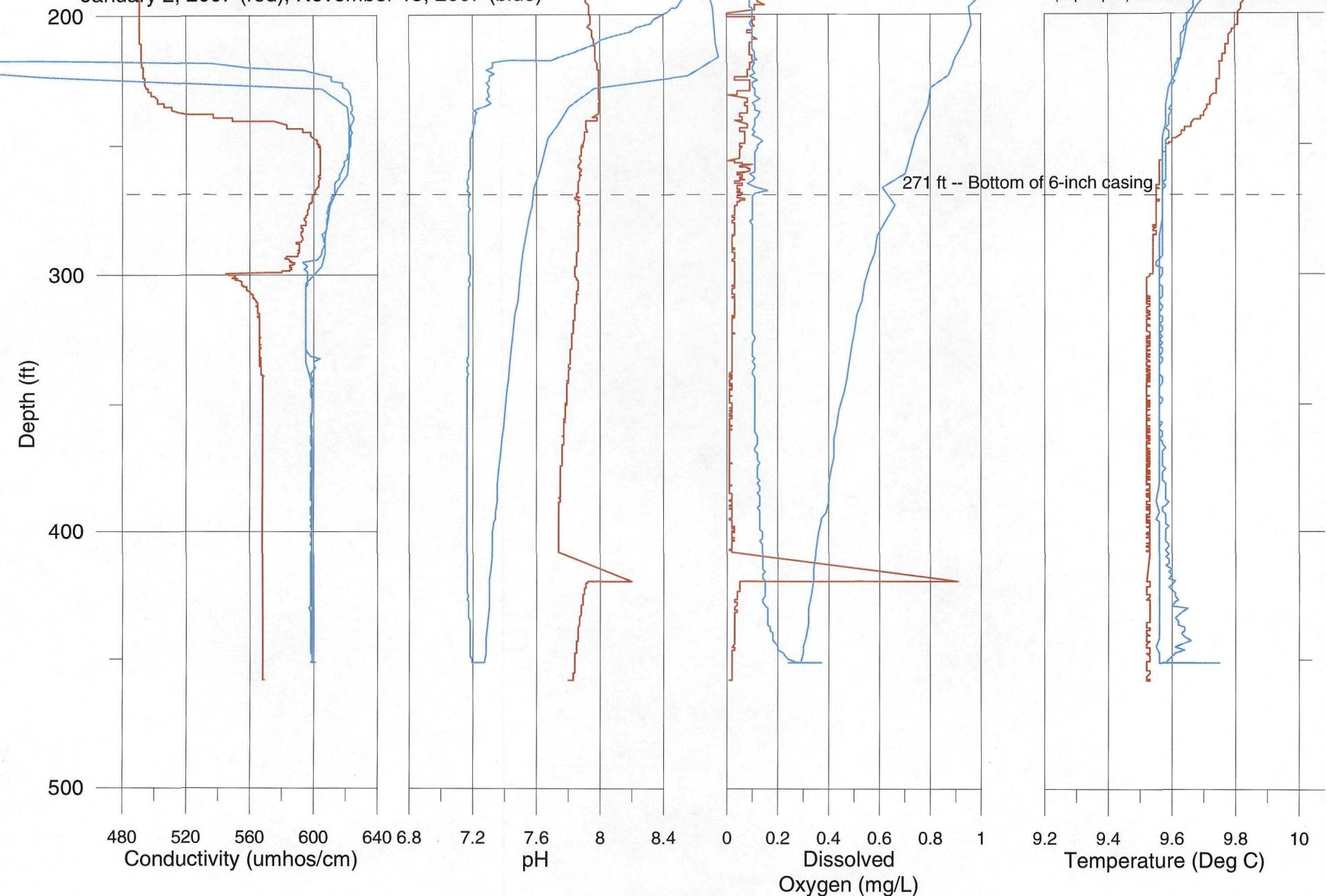


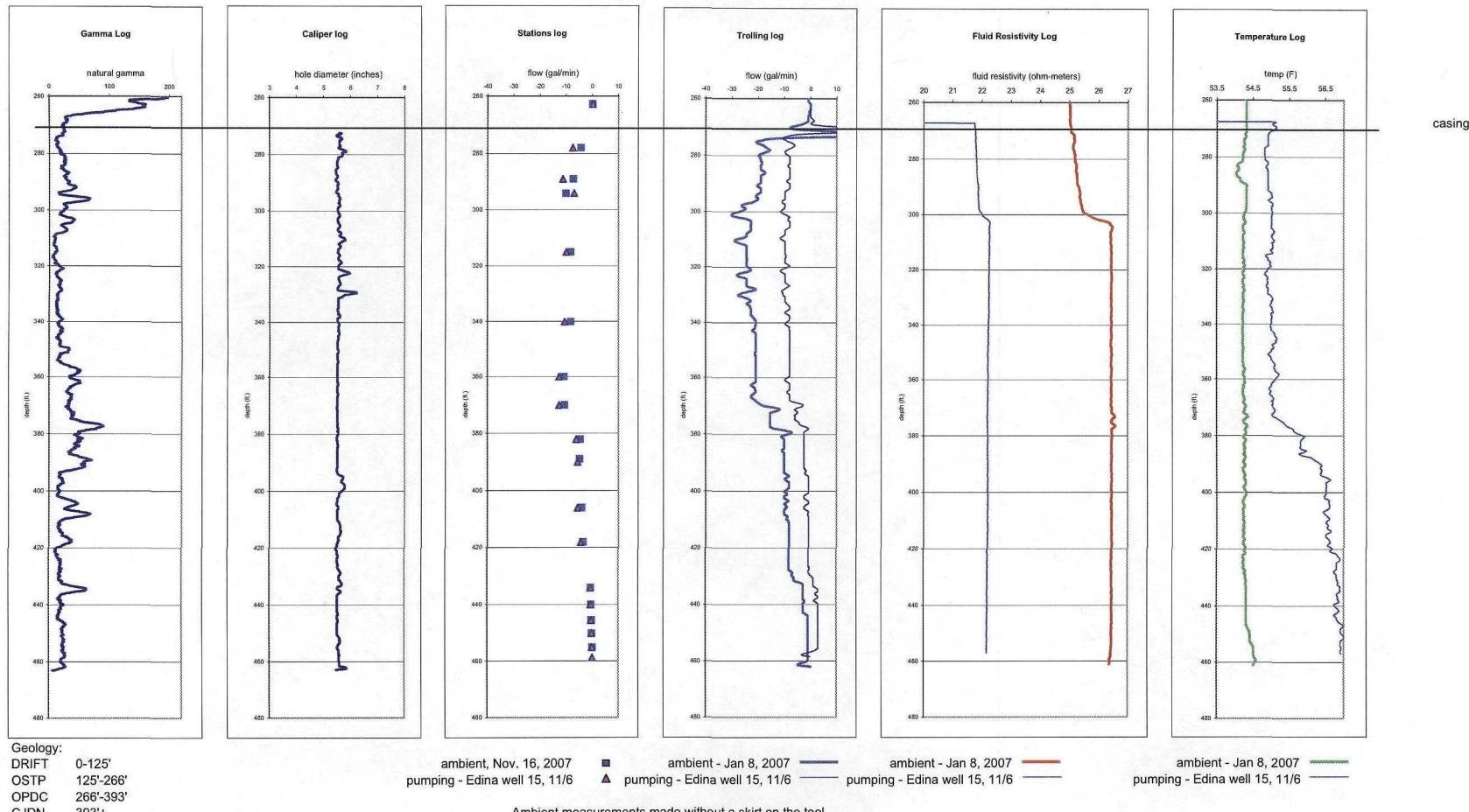
Figure 2. Water Quality Indicator Parameters -- Hydrolab Sonde  
Detail in openhole section of well  
Depth Profile -- Edina Test Well (748656)  
January 2, 2007 (red); November 15, 2007 (blue)



## Appendix C

### Downhole Geophysical Logging Results - Flow Logging

Edina test well 1 Edina, Minnesota  
 Unique Well Number 748656  
 T 117 R 21 Section 32 BDAABA



Geology:

DRIFT 0-125'  
 OSTP 125'-266'  
 OPDC 266'-393'  
 CJDN 393'+

ambient, Nov. 16, 2007   ■  ambient - Jan 8, 2007   —  
 pumping - Edina well 15, 11/6   ▲  pumping - Edina well 15, 11/6   —  
 pumping - Edina well 15, 11/6   —  pumping - Edina well 15, 11/6   —  
 pumping - Edina well 15, 11/6   —

Ambient measurements made without a skirt on the tool  
 Measured flow estimated and plotted to be 5.5% of actual value

**note:** Jan 8, 2007 logged using MGS flowmeter II,  
 November 16, 2007 logged using MGS flowmeter I  
 Flowmeter, temperature and fluid resistivity logs show relative changes in magnitude,  
 but should not be used to show absolute differences because the tools are not identically calibrated.

Logged by Minnesota Geological Survey

January 8, 2007  
 November 16, 2007